PUBLISHED BY SCHOLASTIC INC.

MARCH 1984

VOLUME 2
NUMBER 3

$1.95

Buyers' Guide to MODEMS

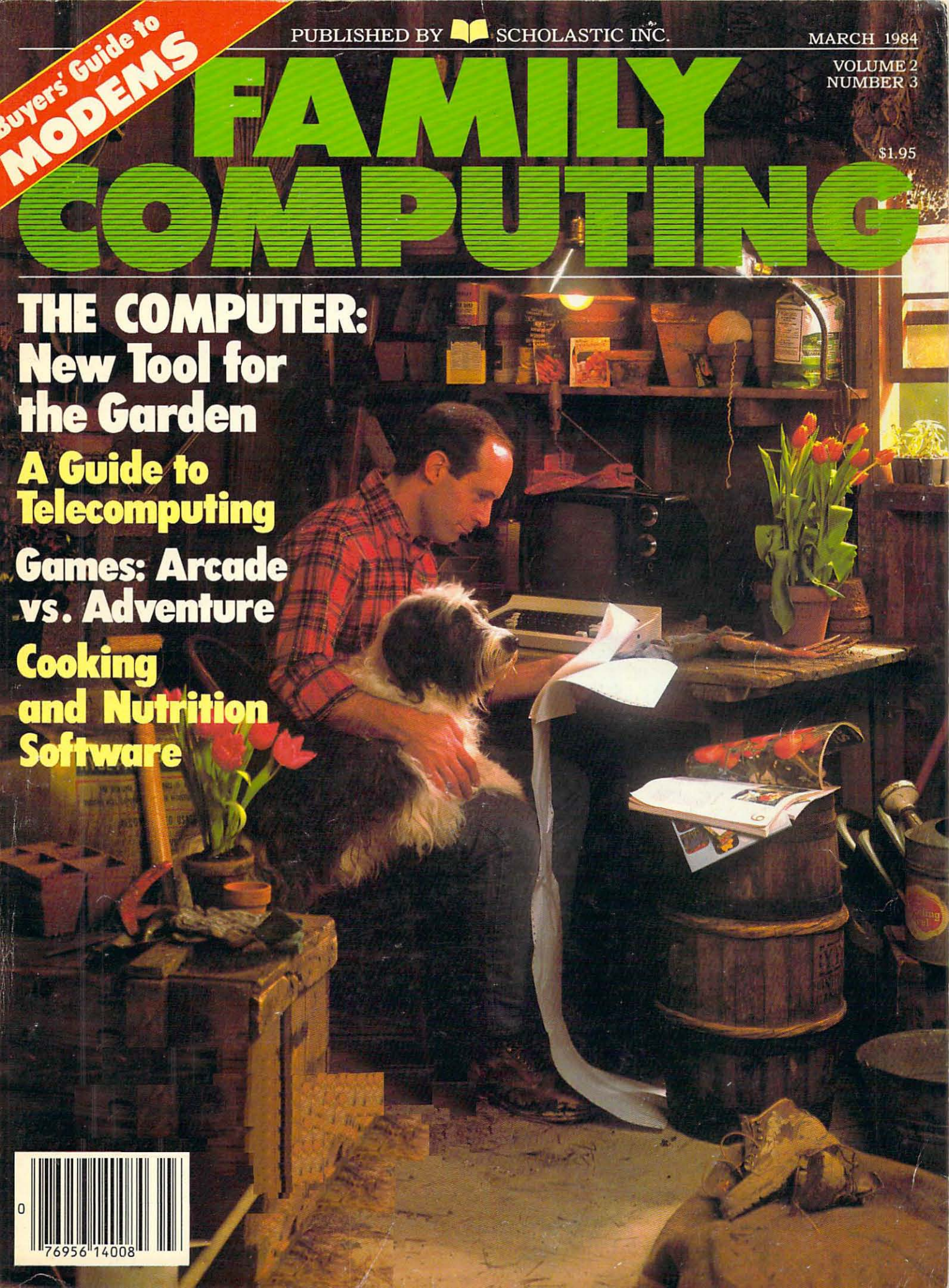
FAMILY COMPUTING

THE COMPUTER: New Tool for the Garden

A Guide to Telecomputing

Games: Arcade vs. Adventure

Cooking and Nutrition Software



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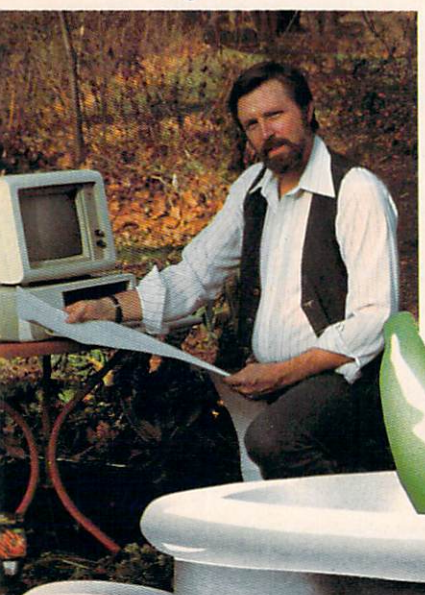

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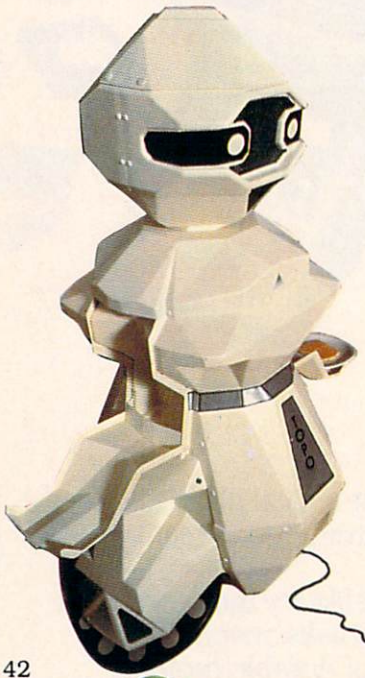

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MARCH
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PUBLISHED BY SCHOLASTIC INC.

VOLUME 2
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For enthusiasts of all levels.

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FAMILY COMPUTING (ISSN 0738-6079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in the U.S. and possessions, 12 issues for $17.97; outside the U.S. add $6 (surface mail) or $24 (airmail). Office of publication: P.O. Box 2700, Monroe, OH 45050-2700. Application to Mail at Second Class Postage Rates is pending at Monroe, Ohio, 45050-9998 and additional offices. POSTMASTER: Send address changes and notice of undelivered copies to FAMILY COMPUTING, P.O. Box 2511, Boulder, CO 80322. Printed in U.S.A.
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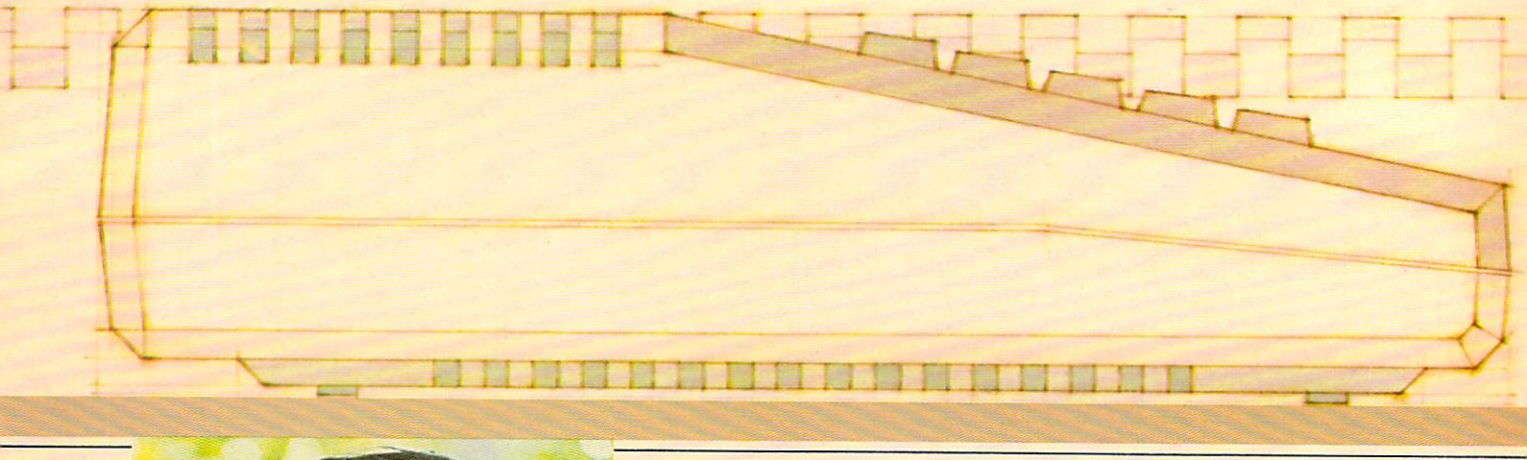

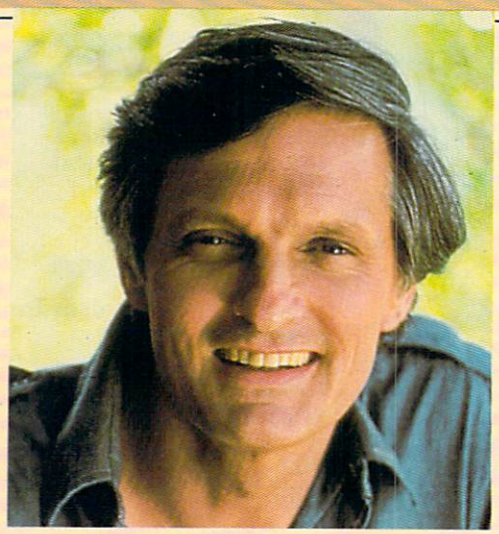

Computer enthusiast Alan Alda uses the ATARI 800XL Computer System. Alda reports: "It's going all the time!"

Introducing the Atari® XL Home Computers: We made them smart enough to know you're only human.

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The new ATARI XL Home Computers prove that you can blend state-of-the-art technology with good old fashioned friendliness. What's a friendly computer? For one thing, it's a computer that speaks your language. Both the new ATARI 600XL™ and the new ATARI 800XL™ Computers come with a built-in BASIC language that uses the same simple English you use to converse with the rest of the world.

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Every ATARI XL Computer comes with a HELP key. Something you won't find on any other home computer. New programs are becoming available that let you use this key for helpful "prompts" when you're unsure of what to do next. Press another special key and your ATARI XL automatically performs a self-diagnostic check—a feature that can save you a needless trip to one of our more than 1,000 ATARI Service℠ Centers.

The ATARI 600XL: It Gets Smarter As You Do.

With 16K of memory, the inexpensive ATARI 600XL can handle over a thousand programs: including education, home management, word processing and personal development. Like all ATARI Home Computers, it gives you 256 colors, four sound channels and Atari's unsurpassed graphics. But unlike a lot of other computers, the ATARI 600XL is ready to grow when you're ready to grow. Every ATARI XL Computer is fully compatible with every ATARI peripheral ("peripherals" are added on to expand what your computer can do).

ATARI peripherals include: a low-cost, letter-perfect printer for word processing. A telephone modem that lets you use your telephone to connect your computer to other computers thousands of miles away. A disk drive and a cassette recorder to store data. And Trak—Balls™ and joysticks to use with Atari's unequalled lineup of great arcade hits. An ATARI 600 XL Computer can be turned into a very brainy 64K computer at a very affordable price.

The ATARI 800XL: Power Enough For Over 2,000 Programs:

With 64K of built-in memory (as much as the more expensive Apple and IBM computers), the ATARI 800XL can take on any of over 2,000 software programs. That's five times as many as a Commodore 64.

There's VisiCalc®[1] for electronic spreadsheets—faster than the fastest accountant. The Home Filing Manager™ to help keep track of everything from medical records to phonograph records. Family Finances to keep up with your cash flow. Educational programs like "Juggles' Rainbow"[2] that helps preschoolers develop skills necessary for recognizing the alphabet. Even "An Invitation To Programming,™" for learning how to program.

When You've Got Our Computer, You've Got Our Number.

If you ever find yourself stuck, or have any questions at all, just give us a call. 800-538-8543. (In California, 800-672-1404.) Feel free to talk it over. Because if there's anything friendlier than an ATARI Home Computer, it's the humans who make them so friendly.

You'll do more with Atari Home Computers.

[1]VisiCalc is a registered trademark of VisiCorp.
[2]Trademark of The Learning Company.

The classic Milton Bradley games you loved as a child are now computer games for the whole family!

Remember how much fun you had as a kid playing Go to the Head of the Class and Game of the States? They were so much fun you didn't realize you were learning at the same time!

Now, Milton Bradley is proud to announce that these ever-popular educational games have been formatted for use with Apple II, IIe home computers.

GO TO THE HEAD OF THE CLASS

This highly competitive general knowledge game is designed for ages 8 and up. Players advance from desk to desk by giving correct answers to over 300 questions on vocabulary, geography, math and history. Three levels of play are available — junior, senior, or graduate — so the whole family can play at once!

GAME OF THE STATES

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by Eileen Shapiro

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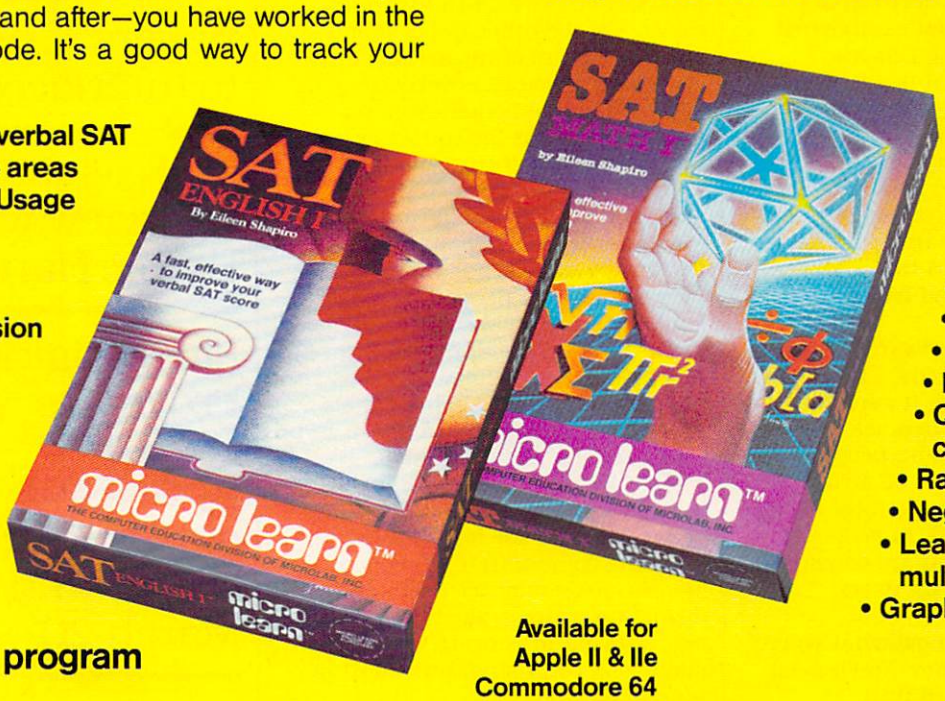
Math SAT from Micro Learn prepares you for every type of question you'll face in the math section of the actual SAT exam. If you're facing SATs, it's as good as a real live tutor. Maybe better.



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- **Probabilities**
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EDITOR'S NOTE
A CONSUMER'S DILEMMA

Exactly one year ago, we were planning our first issue. At that time, it seemed as though the hardware market had settled down to a handful of basic choices for home computing. No one expected that in a year's time, we would see several of these models taken out of production, a major computer manufacturer—Texas Instruments—leave the home market entirely, and totally new contenders appear as top sellers. Rumors of newer, more powerful systems still abound. And we wonder if more of the established machines will disappear.

Where does the situation leave the consumer, other than confused? Should I buy a bargain sellout? Is the new model just announced worth waiting for? Will prices come down radically this year? What if I buy a computer that becomes obsolete? What if the company goes out of business? These are some of the questions we're asked just about every day (see Computing Clinic, page 34, for two purchasing questions).

The best answers to questions about a purchasing decision are constant. We find that established rules—the "Shopping Dos and Don'ts" from our first issue—hold up. We always come right back to the basics. We reprint those rules from time to time in the Primer section that we run every issue. We'll repeat a version of them here to emphasize their importance and value:

1. Figure out who in the family will use the computer and for what purposes.
2. Find out what software is available to meet your needs. Then find out which computers it runs on.
3. Ask questions. Then ask more questions and ask more people the same questions. Don't be afraid of looking stupid. Attend a local users' group meeting to talk to people who use the computer you are considering. (See our article on users' groups, page 46.)
4. Make sure you know what you're getting for your money. You'll need more than a keyboard unit.
5. Demand a demonstration of any computer you're thinking of buying.
6. Read magazines to see what's ahead—for the industry as a whole and for a particular computer.
7. Buy from a reputable dealer and find out what you have to do to get your computer repaired.
8. Take your time. Comparison shop. Learn, and let your ideas change as you learn more.
9. Don't wait for a state-of-the-art machine if you're really interested in starting to use a computer. Several existing computers will be able to meet your needs now.
10. Don't buy a compromise computer that meets no one's needs if you can't find one that serves everyone's. You're better off buying a low-end machine for the kids and another, more advanced model for yourself.

What does this mean for the confused consumer? It means stay calm and rational, keeping in mind why you want a computer in the first place. A bargain that doesn't meet your needs is no bargain at all. And you could end up with a dusty machine or extra clutter in your closet. On the other hand, if you wait for a state-of-the-art machine, you could miss out on experiencing what it's like to benefit from a computer that works for you—that can be a powerful learning tool for you and your children.

We believe it is unfair and unwise for computer manufacturers to leave the burden on the customer. It's time for more of them to take the long view; to provide continuity between models; to support software development; to publish clear documentation; to stand behind their products with service; in short, to be concerned for the consumer.

Manufacturers should stop acting like pioneers on a wagon train and settle down for the long haul. We hope the combination of responsible, serious computer users and information sources like FAMILY COMPUTING, working in concert, can help to stabilize a confusing, but exciting industry.

—THE EDITORS

Some Upcoming Features in FAMILY COMPUTING

All About Computer Camps

Software for Taxes: How to Make April 15 Less Taxing Every Year

Computing Confidential: Marriage and Your Micro

Buyers' Guide to Interfaces

An Exclusive Interview with Herbie Hancock

Plus Original Programs

April Issue on Sale at Your Newsstand March 20

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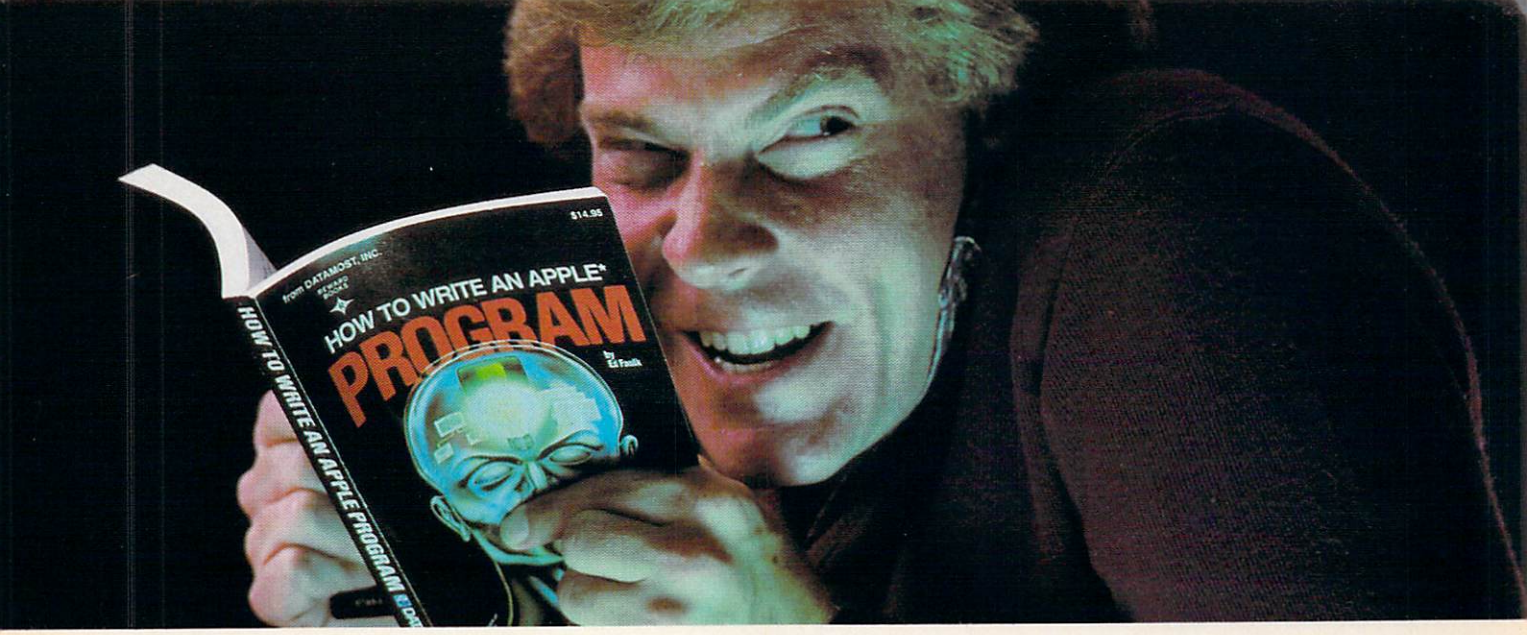

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*Commodore 64 is a trademark of Commodore Business Machines, Inc.

LETTERS

SUPPORT FOR TI

We are an elementary school with TI-99/4As. Please, please continue to have programs and information on TI equipment. Our students thoroughly enjoyed *Pulse Rate*, *Jack-O'-Lantern*, and *Trick or Treat* in your October 1983 issue.

P.J. REED
Wynford South School
Nevada, OH

I am a home-schooling mother and am delighted with your programs for preschoolers. I have just sent off for a subscription to FAMILY COMPUTING because I found myself buying each issue at the bookstore. Keep up the good work, and please don't forget the many TI users.

MRS. ELEANOR TORRES
Slidell, LA

EDITOR'S NOTE: *In order to serve the needs of all our readers,* FAMILY COMPUTING *will continue to publish information and programs for TI users.*

A FAN CLUB?

I have read FAMILY COMPUTING for two months now. I think it's great. I have been thinking about this for a while: I think you should have a FAMILY COMPUTING fan club. It could cost 50 cents (or more if you want). You could advertise in the next issue. I would send you some information and some very good programs.

BERNIE MUDRA, age 10
Addison, IL

EDITOR'S NOTE: *Thanks for your suggestion and your offer. Although we're not about to start a fan club, we'd certainly love more devoted fans like yourself!*

TEACHER'S PET PUBLICATION

My compliments to you on a very fine publication. I am a professor of continuing and vocational education with emphasis in home economics, and I have found your magazine to be especially appropriate for teachers in the field. I have recommended FAMILY COMPUTING as the best for them if they can purchase only one magazine. We are using the IBM PC, so I especially liked your modifications for beginner programs.

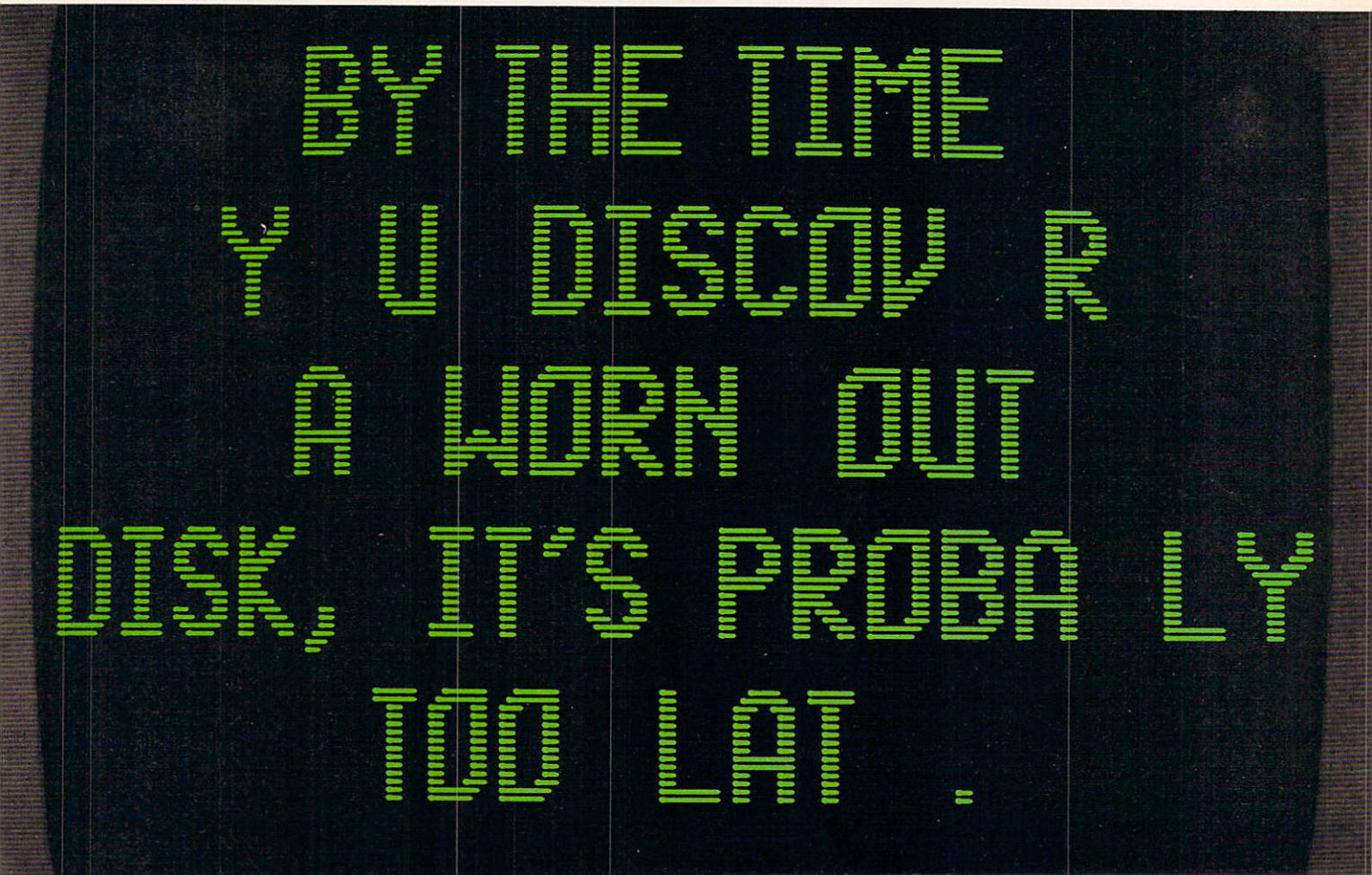
BEATRICE PETRICH, *Professor*
University of Wisconsin
Madison, WI

A DIFFERENCE OF OPINION

In your Computing Clinic (November 1983), Mr. Koetke informed your readers that, with the exception of the short leader, there is no difference between computer cassettes and audio cassettes. Unfortunately, I have to disagree with his opinion! There is a serious difference between audio cassettes and Maxell's data cassettes.

In addition to having a short leader and shorter length than the typical audio cassettes, our data cassettes are of moderate output to ensure the proper sensitivity. They are a low-noise tape with a cassette shell that has been designed specifically for computer-data application. The tape is also drop-out free.

CARL LINDQUIST
Advertising Manager
Maxell Corporation of America
Moonachie, NJ



COCO'S "NO WEAKLING"

I was disappointed that "Popular Word Processing Programs by Computer" (December 1983) failed to mention either *Telewriter 64* or *Super Color Writer* for the CoCo (TRS-80 Color Computer). I understand that these are both full-featured word processors and are reasonably priced. Both offer a variety of screen formats. It seems a shame that people should be left with the impression that CoCo is a weakling in the word-processing department if it isn't true.

Mr. McWilliams's article ("The Layman's Guide to Word Processing") was generally well written and very informative. I appreciate the impossibility of covering EVERYTHING in such an article, and I am not a CoCo owner myself, but I feel CoCo got less than its due.

I read your magazine from cover to cover and was favorably impressed. The articles on Roberta Williams, "Things Computer People Seldom Tell You," and Home Business were among my favorites.

BILL BUCHANAN
Alberta, Canada

EDITOR'S NOTE: *You're right, unfortunately. It's impossible to cover EVERYTHING. We tried to cover the most popular and most established programs for each computer. We'd also like to point out that Peter McWilliams deserves your praise for his informative article. However, he did not write the software guide that followed it and therefore does not deserve any criticism leveled at it.*

GENEALOGY GUIDANCE

I read your article "Castles, Cathedrals, and Computers" in your November 1983 issue. I really enjoyed it, as I have been putting together our family histories. I have been wondering about the different programs available for genealogy to store information.

Which program do you recommend as being the easiest and simplest while still having all the necessary information? Does Atari have any programs available?

Several of us in this area are interested in some programs to store our information. Please advise us where to get a copy of *Genealogical Computing Newsletter.*

MARGERY K. ADAMS
Oberlin, KS

EDITOR'S NOTE: *The* Genealogical Computing Newsletter *we received lists one program for the Atari 800. Titled* Genealogy I and II, *the $69 program is available from Ronan, 5509 Camber Dr., San Diego, CA 92117. The* Genealogical Computing Newsletter *regularly reviews and rates new programs. Its address is: Data Transfer Assn., 5102 Pomeroy Dr., Fairfax, VA 22032.*

LANCELOT TO THE RESCUE

I am writing to let you know how much help Mr. Lance Paavola was. I tried to program the *Christmas Tree* into my TI-99/4A and had problems getting it to work. I told Mr. Paavola what happened, and he told me how to correct the problem. He said to call back if I came across any other errors. Again, he came to the rescue, and now the program works great. I am now a joyful reader of your magazine. I am also giving it as a gift to my wife for Christmas.

TIMOTHY GUY
Winter Springs, FL

FAMILY COMPUTING *looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor,* FAMILY COMPUTING, *730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit your letters for length and clarity.*

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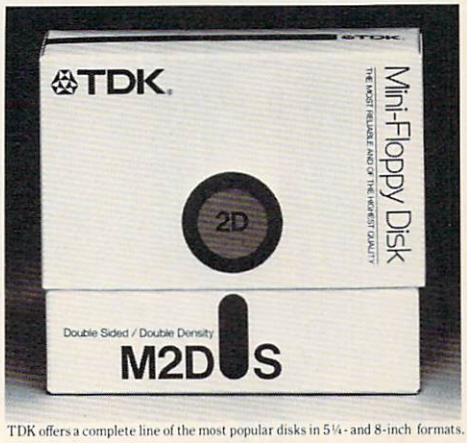

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BEHIND THE SCREENS
PEOPLE, NEWS, AND TRENDS

EDITED BY JOHN WALLACE

The Robotorium—It's Robot's Play

It's hard to tell if Debbie Huglin is busy working or playing, but there's no doubt she's busy! By day, she's a struggling sculptor; by night, she's proprietor, creator, and life force behind the Robotorium, in New York City's trendy SoHo neighborhood. An avid collector, designer, and robot "philosopher," Huglin says that robots are the toys of the past as well as the tools of the future.

"A lot of toys from your childhood are really automatons," she says as battalions of Rock-'Em-Sock-'Em Robots, and Laser Blasters whir, whiz, and blink across the table. "These toys are all intimate robotics parts. Get comfortable with them, play with robot toys, and you'll be ready for household robots."

Sharing the table with the pint-sized "Zoids" selling for $5 are larger, more sophisticated creations. The "Rhino," for instance, sells for $3,000 and is controlled by Huglin's Apple IIe. Resembling an elaborate erector set, Rhino can move its manipulator arm along six different axes, and lift your coffee cup with ease.

—ROBIN RASKIN

PHOTO BY MARCIA WOODING

Debbie Huglin, proprietor of the Robotorium, shows a sample of her robot repertoire.

How to Sell Relief

ViMart's new laserdisk console means easy access to new and top-selling software.

The frustrations of the software search—programs being out of stock, confusion over computer compatibility (Will that version of *Diggity Donk* that looks so good on the Atari work on my Commodore?)—are enough to make one turn to programming.

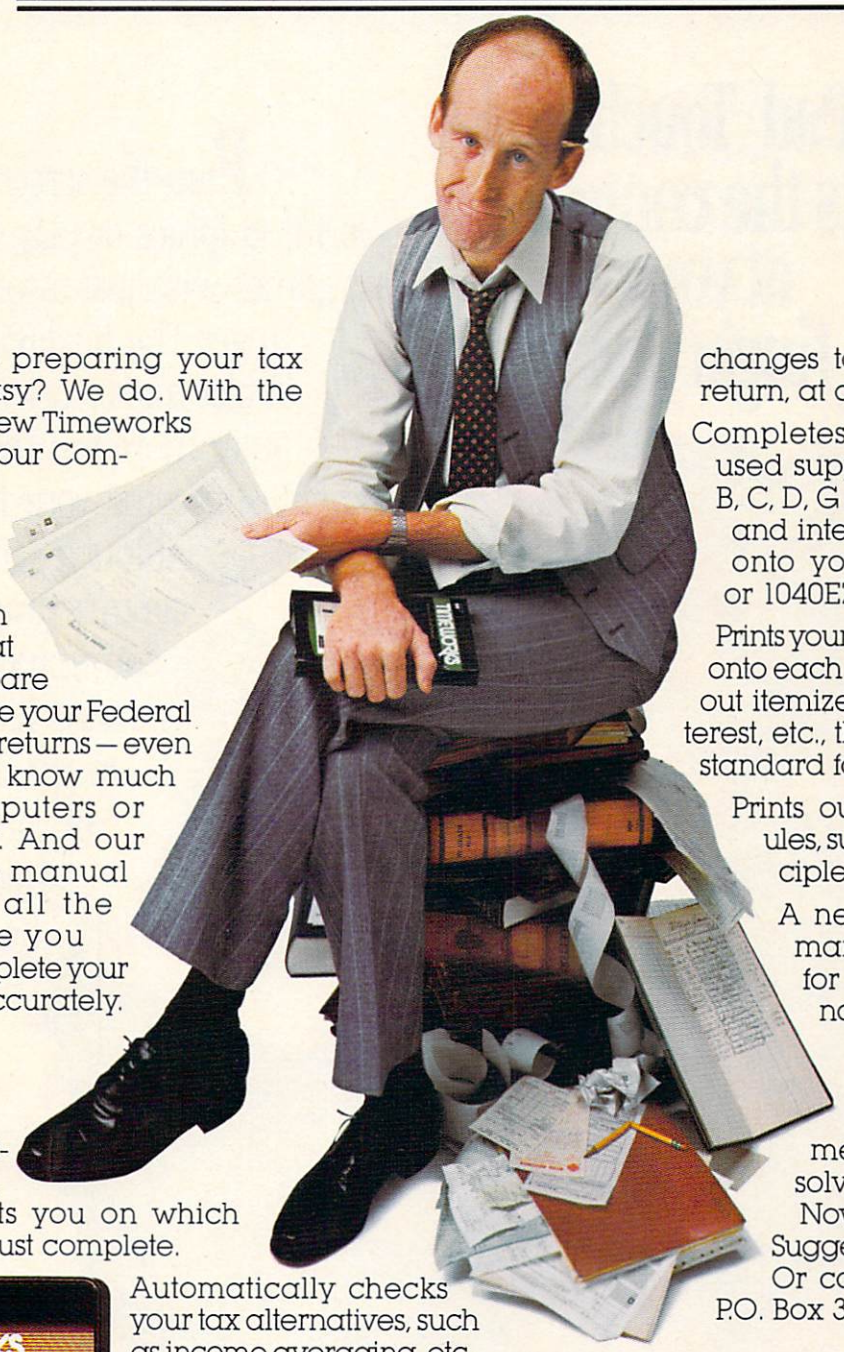
Thankfully, a number of different retailing schemes have recently emerged which could spell relief for the headaches incurred during program purchase.

- The Xante Corporation is manufacturing a "Production Station." Customers purchase software that the store owner has copied (or downloaded) into cartridge or disk format from a central file in Xante's mainframe computer. Of course, a cut of the sales goes to the software's manufacturer as usual.
- ViMart is introducing a large laserdisk unit with a disk full of the top-selling and most noteworthy educational and entertainment software on the market. A 90-second presentation contains an excerpt and brief description of the program. The latest and most important selections for the Apple, Atari, Commodore 64 and VIC-20, and IBM computers are compiled by researchers and put on disks which are updated each month.
- Sofsearch offers a service whereby the software shopper with a modem can browse, free of cost, through a file of more than 30,000 business, educational, and entertainment packages.

Innovations such as these are going to make software shopping a lot easier for any member of the family, even those who prefer to sit back and watch as the rest of the clan devours the latest arcade offering. →

—PAM HOROWITZ

NOW! FOR $49.95 SWIFTAX WILL PREPARE YOUR INCOME TAX RETURN SWIFTLY.



Who says preparing your tax return is easy? We do. With the incredible new Timeworks Swiftax for your Commodore 64.*

With an easy-to-operate, menu-driven program that lets you prepare and complete your Federal income tax returns—even if you don't know much about computers or accounting. And our easy-to-use manual gives you all the knowledge you need to complete your tax return accurately.

Features:

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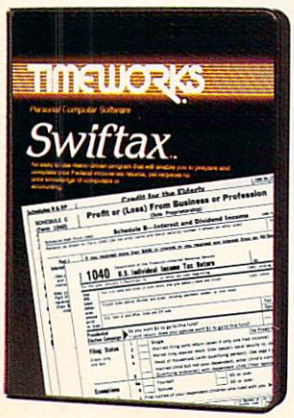

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Completes the most commonly used supporting schedules—A, B, C, D, G and W, stores the totals, and integrates this information onto your Form 1040, 1040A or 1040EZ.

Prints your tax information directly onto each IRS schedule and prints out itemized lists of dividends, interest, etc., that are too long for the standard forms.

Prints out amortization schedules, summarizing yearly principle and interest payments.

A new program disk and manual can be obtained for each future year at a nominal charge.

Swiftax! It's just another good example of Timeworks' commitment to quality, problem-solving programming.

Now at your favorite dealer Suggested retail price, $49.95. Or contact Timeworks, Inc., P.O. Box 321, Deerfield, IL 60015.

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with your computer.

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See the KoalaPad Touch Tablet at the computer store nearest you. To locate the dealer in your area, call toll free 800-227-6703. (In California, 800-632-7979.)

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BEHIND THE SCREENS

From M*A*S*H to Microchips

PHOTO BY ARLENE ALDA

An untrue word does not escape Hawkeye's lips.

"Understatement and credibility are the best ways to convince people," says Ted Voss, Atari's vice president of marketing and advertising. In service to this philosophy, the company has hired former M*A*S*H star Alan Alda to do the understating. After years as the first army surgeon of the airwaves, the trustworthy Hawkeye's hawking the new Atari XL series.

According to the agency handling the ad campaign, Alda has worked out an unusual agreement whereby the star maintains 100 percent control over the commercials' contents. He doesn't say what he doesn't believe.

Alda is well-supplied with Atari equipment. He has an 800XL at home and another in the office and uses them to keep track city-by-city of florists, limo services, and his favorite restaurants, as well as to edit his scripts. Alda has tried his hand at programming, too. Within three days of being presented with his new computer, he had authored his first program, titled *Hi Doc*, which simulates a session with a psychoanalyst.

—KEN COACH

The Personal Computer Called to Arms

The personal computer has been drafted. Last fall some 300 U.S. Army and Air Force colonels and Navy captains used 17 Kaypro computers to set up a communications network in a simulated global war. The computers were deployed as part of an annual strategy exercise conducted by the National Defense University at Fort McNair in Washington, D.C. During a five-day period, 11 hypothetical worldwide command centers were established, with 13,000 messages transmitted over a network similar to such popular public access telecommunications networks as The Source and Telenet.

It calls to mind last summer's popular movie *WarGames*, in which a hacker's fiddlings on his home computer inadvertently almost trigger World War III. According to a spokesman for the company that developed the central networking "host" system, it was not nearly so dramatic. He couldn't say much more about the exact nature of the experiment, however. The Defense Department is, as he put it, "touchy" about releasing such information.

—KEN COACH

Through Rain and Wind and Sleet and Hail . . .

MCI's electronic-mail service could transform even the simplest forms of correspondence.

Thanks to MCI, the company that put itself on the map by offering a reasonably priced alternative to Ma Bell's long-distance rates, correspondents will be able to electronically transmit words anywhere in the country—even if the recipient is not "on-line."

With a new service provided by MCI, anyone with a computer (from the VIC to the IBM and up) and the proper telecommunications equipment will be able to send a "letter" that will arrive at its destination in anywhere from seconds to two days. It costs nothing to register with MCI and there are a variety of different services offered, ranging from simple $1 messages transmitted modem to modem, to overnight letters sent from the personal computer to any non-computerized household by noon the next day for $6. One of the new system's most appealing features is its ability to put a signature or letterhead (electronically stored and specially printed out) on correspondence.

MCI's versatility and relative low-cost make it yet another reason to get the household on-line.

May the Force Be with You

Almost two years ago, two of the all-time favorite entertainment enterprises—George Lucas's Lucasfilms (of *Star Wars* fame) and Atari computers—embarked on a strange journey. In the great Jedi tradition, the two joined forces to develop state-of-the-art home computer games and exploit the most sophisticated computer technologies for use in films.

Since its inception, the Lucasfilms Computer Division has been creating remarkable special computer-generated effects and hardware for the film industry. Now it's the home computer's turn. Home computer games could well evolve into "interactive movies."

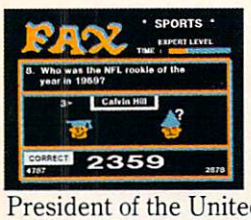
Peter Langston, director of games development at Lucasfilms, couldn't be specific about the games that were in production, other than that they'll be out sometime early this year and that the first ones will be a sports game and an adventure game.

"We're using some sophisticated techniques we've stolen from the film industry, and both industries will benefit. Film may become more interactive, and video games will be more cinematic," says Langston.

—ROBIN RASKIN

If you've got a good bite-sized piece of computer-related news involving people, trends, or innovations, let's hear it. We will pay $25 for each item we publish. Write to Behind the Screens, c/o FAMILY COMPUTING, *730 Broadway, New York, NY 10003.*

FAX.™
WHO DISCOVERED AMERICA?*



Chances are, you got the answer right. But not all the questions in this computer version of the popular Exidy Arcade Quiz-game are so easy. Can you name the only bachelor to become the President of the United States? Or identify what the initials stand for in O. J. Simpson's name? (If you guessed "Orange Juice," you *won't* score any points.)

Remember, FAX isn't just a thinking game—it's a fast thinking game. FAX pits your knowledge and reflexes against the clock...or an opponent. The faster you respond, the more points you score.

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**Christopher Columbus*

HOME-SCHOOL CONNECTION

THE KEYS TO SUCCESS

Learning to type is the first step to computer literacy.

BY DANA RUBIN

The computer age has spawned a new generation of students, high-tech wizards who can sputter sophisticated lingo at an age when some of their parents had barely mastered their ABCs.

But parents and teachers have recently begun to realize that, despite all the fancy yammering, kids still need to learn the basics. Students can be computer savvy and remain slow on the keyboard—especially if they don't know how to type.

"I think people are finding that the computer is great, but you still have to know how to use it," says Bill Maxfield, a high school teacher in Campbell, California, in the heart of Silicon Valley. The faster students can type, he says, the quicker they can enter data into their computers. And the less frustrated they get in the process.

LEARNING THE BASICS

Although computers are designed to be accessible, students still need basic skills to get some use out of them. "It's just like using a calculator," Maxfield says. "People think that a calculator is going to solve all their math problems. But if you don't know how to set up the problem, it won't do you a bit of good. With a computer you don't have to be a super typist, but you've got to know how to use the keyboard to make it work for you."

Maxfield teaches both typing and computer literacy at Blackford High School, and his students are required to take typing before they can sign up for the computer class. Although Maxfield's course is officially titled "Personal Typing," like most of the new generation of typing teachers Maxfield prefers to call his subject "keyboarding," since it's not quite the same as a traditional typing class. For example, students spend less time memorizing the number of spaces between the date and the salutation on a business letter than concentrating on accuracy and speed.

A POPULAR COURSE

Although typing is not required in order to enroll in computer classes at Lyons Township High School, in the Chicago area, a majority of the students sign up anyway, says Carl Nemecek, chairman of the business education department.

To ease the transition from typewriter to keyboard, Lyons Township teachers have tacked on to the end of every typing course two weeks of hands-on experience with microcomputers and an orientation to word processing. Nemecek says it helps students know what they're getting into when they face a choice of seven different computer courses offered in the district.

Lyons Township administrators have made a sizable investment in their students' futures—$250,000 on computers alone in the past three years—and they want their students to take full advantage of it. When the district began to push typing as preparation for computer classes last year, the students were quick to respond. "We don't have to do much of a sell job," Nemecek says. "They're

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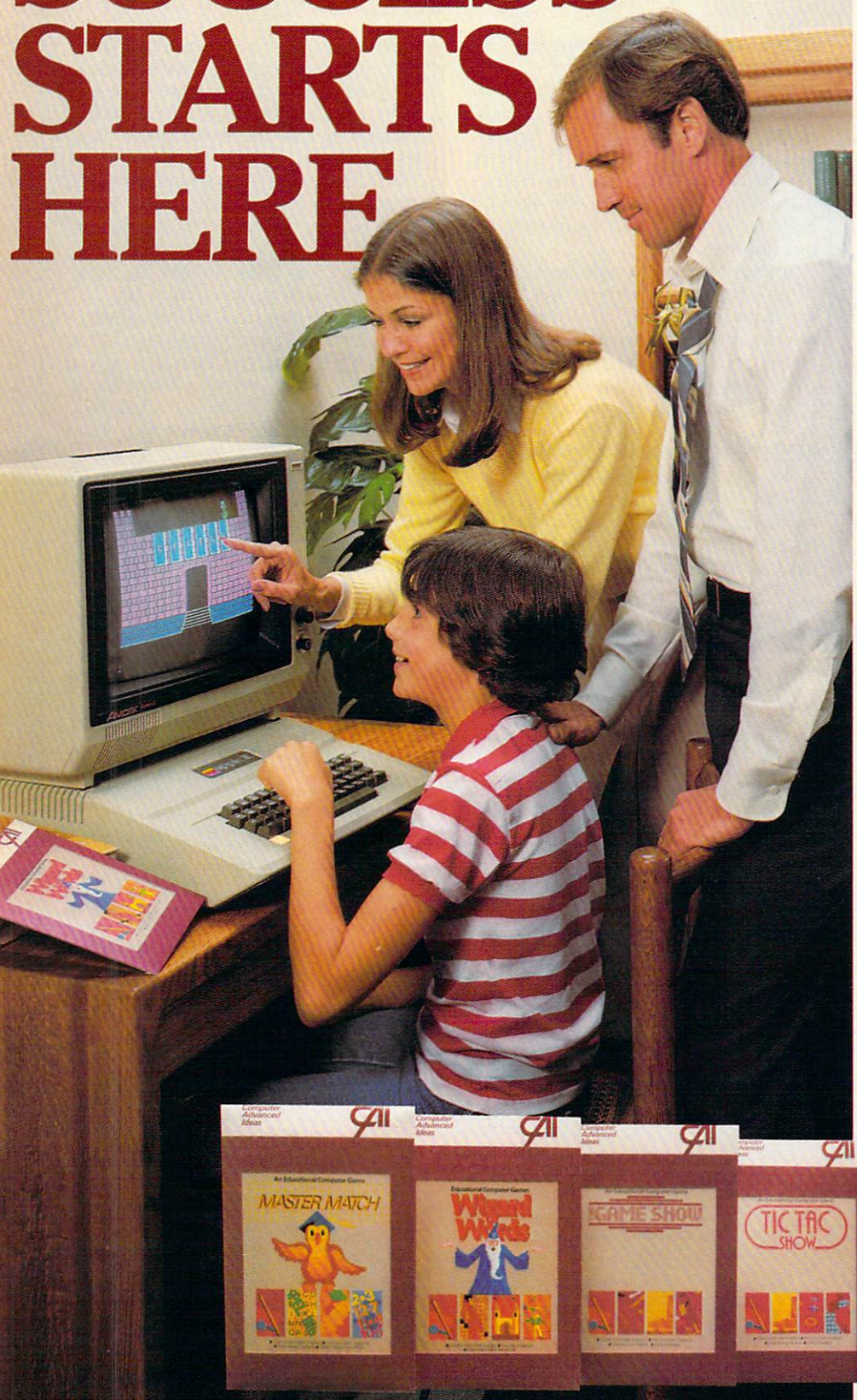
DANA RUBIN, *a reporter for the San Jose* Mercury-News, *wrote about parent-teacher understanding in the October issue of* FAMILY COMPUTING.

ILLUSTRATION BY CARTER GOODRICH

SUCCESS STARTS HERE



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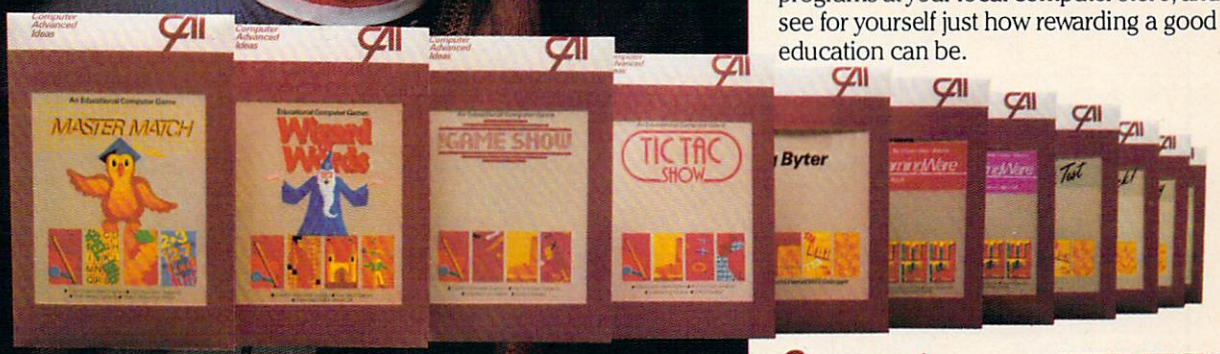
CAI is a group of experienced educators and programmers who believe that success begins with opportunities you create at home. Ask to see a demonstration of CAI programs at your local computer store, and see for yourself just how rewarding a good education can be.



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clamoring to get in."

Nemecek believes the kids in his district are taking to typing because they're thinking ahead. Whether they go on to college—as do 75 percent of the students in the district—or take a job, the students know they'll need keyboarding skills to survive. "They take it simply because they want the skills. They're very practical," Nemecek says.

But students everywhere aren't so enthusiastic about a skill some view as less than glamorous. Janet Oneto, of Scotts Valley, California, wanted her kids to learn how to type before taking computer courses and found that her children weren't thrilled at the prospect, complaining that typing classes are notoriously boring. Her 12-year-old son, Bobby, was especially hard to convince.

"My son kind of gave me flak," Oneto said. "He didn't want to [take the course]. It was just not the 'in' thing to do."

On this issue, however, Oneto insisted. She had taken typing classes in the 1960s, and they had helped her immensely in her job at a bank. But Oneto says she and her fellow classmates had learned the skill for reasons very different from those of her children.

"I learned how to type because I thought it would help me get by in the business world," she says. "I'm having my kids learn it because computers are going to be a part of their lives and I think it's just going to save them time in the long run."

LIVING ROOM LEARNING

Not all students are learning to type in classroom settings. Software packages for learning and practicing typing skills have been on the market for more than a year. [*For information on available software, see accompanying chart.*] Enthusiastic supporters say that arcade-style typing games eliminate the drudgery of lessons by turning them into a fast-action sport.

Jim Hauser is the designer of one of the most successful games, *Type Attack*. A former physics instructor at California Polytechnic State University in San Luis Obispo, he was trying to learn to type when he dreamed up the idea. In his game, the letters of the alphabet soar down the computer screen like alien invaders, vulnerable only to those who can type in the proper keys before the letters plummet to the bottom.

Hauser sees *Type Attack* as an educational device. It's an important link, he says, between the innocent thrills of a computer game and the hard-earned rewards of study. He designed the game to prove a point: "If

THE ABCs OF TYPING PROGRAMS

The following chart highlights a selection of programs designed to improve keyboard command for aspiring typists of all ages and skill levels. Another option is *Type Test*, a reader-written program for the TRS-80 Model III, included in FAMILY COMPUTING's January issue.

Name of Program	Description	Publisher	Hardware Requirements	Price
MASTERTYPE	Diffuse approaching missiles by typing "enemy" words correctly in this arcade-style program. (See Software Guide, p. 120, for more on *Master-Type*.)	Scarborough Systems 25 N. Broadway Tarrytown, NY 10591 (914) 332-4545	Apple II/II plus/IIe/III w/ emulator, 48K (disk), and Applesoft ROM; Atari 400/800/1200XL, 16K (cartridge), 32K (cassette); Commodore 64 (disk and cartridge); IBM PC (disk)	$39.95; $49.95 for IBM PC
TOUCH TYPING TUTOR	Start from scratch or brush up on your skills. Features an on-screen keyboard and introduces keys in color.	Taylormade Software P.O. Box 5574 Lincoln, NB 68505 (402) 488-0196	Commodore 64 (disk and cassette); VIC-20, 8K (cassette)	$19.95 for cassette; $29.95 for disk
TOUCH TYPING TUTOR	Develop lightning-fast keyboard fingers with this drill-and-practice program designed for the TI-99/4A keyboard. Includes lessons and drills.	Texas Instruments P.O. Box 53 Lubbock, TX 79408 (800) TI-CARES	TI-99/4A, 32K (disk)	$39.95
TYPE AND LEARN	Improve your command of the keyboard as you learn about computers in this drill-and-practice program that features computer-related words and paragraphs. Beginner through advanced levels.	Simsoft P.O. Box 7095 Port Huron, MI 48301 (313) 984-1570	IBM PC w/PC DOS (disk); TI-99/4A, 64K (disk)	$49.95
TYPE ATTACK	Learn a lesson from Lexicon, a distant planet whose expert-typist inhabitants defeated the armies of letters and words that are now plummeting toward the earth! Your only effective weapon is your typing skill in this arcade-style program.	Sirius Software 10364 Rockingham Dr. Sacramento, CA 95827 (916) 366-1195	Apple II/II plus/IIe/III w/ emulator, 48K (disk); Atari 800/1200XL, 48K (disk); Commodore VIC-20, 5K (cartridge), C 64 (disk); IBM PC, PC*jr*, 64K (disk)	$39.95
TYPING TUTOR	Learn the keyboard and track speed and accuracy via a no-nonsense approach. Beginner through advanced levels.	Tandy/Radio Shack 1800 One Tandy Center Fort Worth, TX 76102 (817) 390-3011	TRS-80 Color Computer, 16K (program pack)	$29.95
TYPING TUTOR II	Choose beginner, intermediate, or advanced levels, learn new letters or test speed on long passages. (See Software Guide, p. 120, for more on *Typing Tutor II*.)	Microsoft 10700 Northup Way Bellevue, WA 98004 (206) 828-8080	Apple II/II plus/IIe, 48K (disk)	$24.95
TYPING TUTOR III	Train for keyboard use and see a graphic illustration of your progress in this program designed for the serious computerist. Also includes "Letter Invaders," a shoot-'em-up game mode that breaks up the routine of lessons and speed tests.	Simon & Schuster Electronic Publishing 1230 Ave. of the Americas New York, NY 10020 (212) 245-6400	Apple II/II plus/IIe, 48K (disk); IBM PC and PC*jr*, 64K (disk); versions are planned for Commodore 64 and ADAM	$49.95

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Early Games feature multiple activities, easy to use picture menus, and colorful graphics. The games are fun, children love to play them! That's why they learn from them.

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HOME-SCHOOL CONNECTION

THE KEYBOARD CONTROVERSY

One of the great things about learning to type is that you only have to do it once. Like riding a bike, once you've mastered the skill—you never forget it.

At least, that used to be true.

Within the past year, however, more and more businesses are taking note of a new typing keyboard designed to be faster and more efficient than the standard version (see illustration). Actually, the modified system isn't new—it's based on a design copyrighted almost 50 years ago by August Dvorak, who discovered he could improve typing speed and reduce finger fatigue by placing the most frequently used letters on the same row of the keyboard. The fingers would get less tired, he reasoned, if they traveled less.

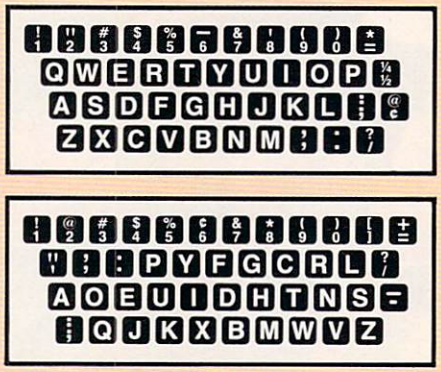
Dvorak was right. In fact, the conventional keyboard—called QWERTY for short—was never intended to facilitate speed. It was designed in the 19th century to slow typists down, so that the keys on their typewriters wouldn't jam.

Despite the advantages of the Dvorak system, most people continued to use the standard arrangement simply because it was too much trouble to switch. But now computer companies can change their systems from QWERTY to the Dvorak system merely by rewriting software or recoding a chip.

MAKING THE CHANGE

A small but significant number of companies, including State Farm Insurance and Ford Motor Company, are testing the Dvorak system, according to Virginia Russell, who heads the Dvorak International Federation. At least 30 companies throughout the country, from car manufacturers to publishing houses, are considering converting to the Dvorak keyboard, she says. Some typewriter companies offer Dvorak as an alternative to the regular keyboard. Some computer industry giants, such as Apple and Wang, already have the ability to switch their equipment from one keyboard to the other.

Russell believes that all children learning to type should be taught on the Dvorak keyboard. "Kids love it because all the common words that they use are on one row—no jumping from top to bottom."



Old vs. new: Should the keyboard be changed?

Dvorak fans say its benefits outweigh the hassle of trying to master a new keyboard. Stephen Lawrenz, a pastor at Bethany Lutheran Church in Gibsonia, Pennsylvania, used QWERTY for 16 years before trying out the Dvorak system last summer. Lawrenz, who does a lot of typing for both church and personal business, heard about the alternative keyboard from a friend and was curious.

Because he did not want to invest in a new keyboard right away, Lawrenz spent the first few days looking at a picture of the Dvorak keys while typing "The quick brown fox" exercise over and over on his QWERTY typewriter; he then continued to practice learning the new keyboard. It took a lot of patience and persistence, he said. "I just kept practicing that line over and over again. At first I was in two worlds, and all that came out was garbage. You just have to make up your mind that this key is no longer an 'R' but a 'P'—and keep typing."

Lawrenz memorized the new keys in a few days, but it took him months to pick up speed. Now he is sold on Dvorak. "I can't type QWERTY anymore," he said. Although bilingual people can go back and forth easily from one language to another, "it's not the same as muscular movement with your hands," says Lawrenz. "I just can't do it—my fingers want to move the Dvorak way."

But don't throw out your old keyboard yet. Even those devoted to the Dvorak system agree it's not for everyone. "I myself don't type all day long, so Dvorak's not going to do a heck of a lot for me," admits Mark Tiddens, marketing manager for Key Tronic, a Spokane-based computer keyboard manufacturer that is currently marketing a Dvorak keyboard for the IBM PC. "But it certainly will [help] keyboard operators, secretaries, word processors, and data-processing operators."

SHOULD SCHOOLS SWITCH?

Businesses aiming for higher productivity have been the first to consider the new system, Tiddens says. He predicts that schools will be the last to make the change, partly because they lack the resources to modify their equipment. He says another explanation for the hesitation may be that many school administrators and teachers are reluctant to make major changes.

Sylvia Ellefsen, a public school library media specialist in Santa Cruz, California, explains why. Ellefsen's job involves teaching elementary school children to use the computers in the library, and the thought of a completely new keyboard makes her squirm. "I'm nervous that I've done this wonderful job of teaching these children to type, and bam—we switch to a new keyboard," she says.

"It's sort of like the metric system. A few years back, they told us to prepare children for the metric system—what millimeters are and everything—but then it never changed. I have a hard time teaching anything that might be irrelevant later."

Yet if the Dvorak system does become widely accepted by businesses throughout the country, schools may have to make the change if their students are to be prepared for the job market.

The Dvorak system may not be the only radical change in keyboard comfort. To ease the strain on a typist's arms and shoulders, a team of West German researchers have proposed splitting the keyboard into two parts—one for each hand. Each half would be angled outward from the top, allowing the fingers to move in a more natural manner. According to *Science Digest*, no American manufacturers have tested the system so far. But it may be a concept they'll take seriously in coming years.

—D.R.

These are the hands of a master typist. (Jonathan Pandolfi, age 7.)

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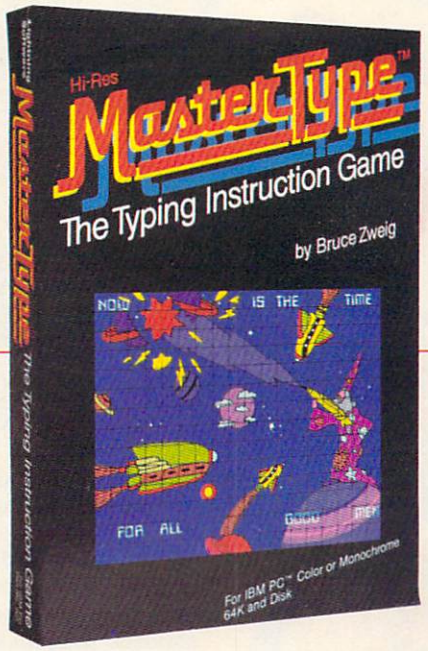

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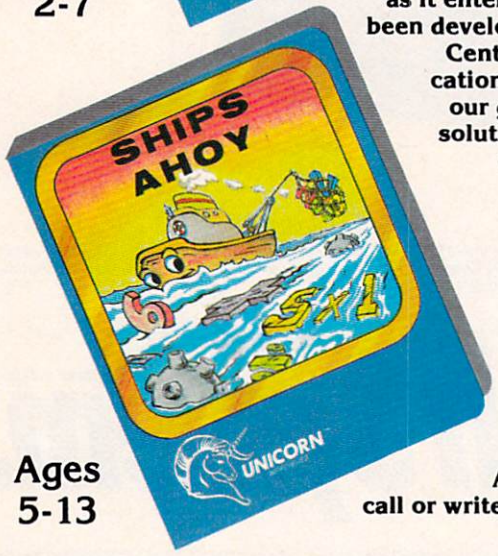

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HOME-SCHOOL CONNECTION

you can make something as intrinsically boring and tedious as typing into a game, just think what you can do with algebra, geometry, or physics."

WHAT'S TOO YOUNG TO TYPE?

At what age should students start learning to type? The earlier the better, says Anita Ertle, a second-grade teacher in Bend, Oregon. Bad habits can be hard to break. "Once a kid has gotten used to keyboarding incorrectly, it's extremely difficult to program them to do it right," she says.

So when Ertle noticed many of her students hunting and pecking their way through computer lessons, she decided to do something about it.

She designed a mock keyboard out of cardboard. On the keyboard, she drew a pair of little hands, color-coding the fingernails to show which finger goes with which key. Next year her system will probably be used throughout the Bend school district to teach youngsters how to type. And Ertle, an entrepreneur, is trying to copyright her design.

Teaching typing to the very young, some of whom have just learned to read, requires some modifications of the traditional approach. "With young children," Ertle says, "you can't just leave them with a typing manual, so you call out the letter in class: 'f-f-f-space,' then 'j-j-j-space.' " Since that approach can get to be tiring, she made some audio tapes of the lessons, and now she plays them to her classes for about 10 minutes a day.

Sometimes people ask Ertle whether the tiny hands of a six-year-old can manipulate an adult-size keyboard. She already has a stock reply: "That doesn't make a bit of difference. It's just a matter of exercise."

On the other end of the age range, many adults are taking a sudden interest in typing skills. Glen Neswick, principal of Lancaster High School, outside of Dallas, says his district began offering evening typing classes last year for adults who wanted the keyboarding skills. "We are finding we simply have more of a demand for it. People are realizing that's where the job market is. It's hard to walk into an office and get a job today without word-processing skills of some sort, and they're finding out they need the keyboard skills to do it." FC

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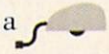
Jane does away with the keyboard . Instead, a simple, hand-held device called a  mouse selects from a variety of applications. From letters to lists, to calculations and spreadsheets. Jane does them all.

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GAMES

TO SHOOT-'EM-UP OR NOT TO SHOOT-'EM-UP

BY JAMES DELSON

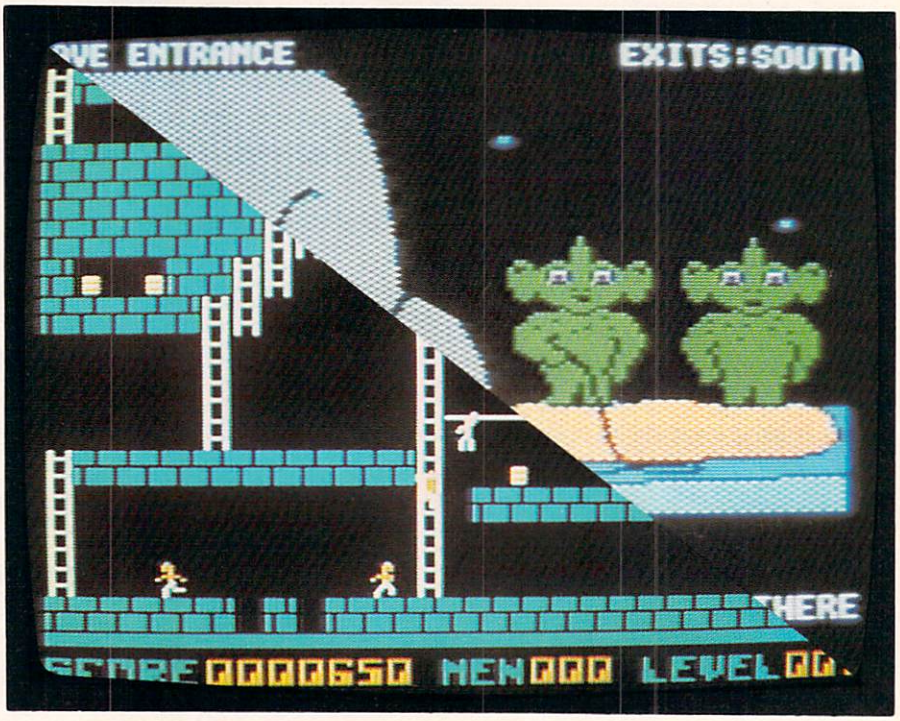
The computer games market is a rich, colorful, and competitive arena, with innovations crowding out old contenders month by month. Unfortunately, obsolescence is a frequent phenomenon; most families with limited software budgets may find their games outmoded within a few months of purchase.

My own preoccupation with the adventure, strategy, and hybrid types of computer games (often covered at the expense of popular arcade games) is based on the feeling I have about the relative staying power of the different genres.

PICKINESS PAYS OFF

It's not that there isn't room in home collections and the games market for every type of software. Road races, ladder games, lock and chase scenarios, and the occasional *Pac-Man* clone, alongside sports simulations, strategy games, hybrids combining arcade skills with one or more other challenges, text and graphic adventures, and war games—certainly the ideal library would benefit from a selection of these. And obviously everyone has their own special tastes. Just as movies and books have different appeals, so, too, do computer games strike different chords with different people. But, when it comes to laying out $30 to $40 per program, you've got to be picky.

Face it, all games run the risk of growing stale. An exciting diversion today may wind up as the landfill of tomorrow. I find that adventure and strategy games tend to be more innovative and more interesting. In my opinion, they have longer lasting appeal because they contain the added dimension of strategic and tactical planning.



OUTSHINING THE CLASSICS

There's no doubt that arcade games were largely responsible for the introduction of computers into the home entertainment field in the first place. They made their contribution but now have been left behind by the growing number of hybrids that utilize arcade skills but which offer far more than monster-chomping, spaceship-zapping, and other hand-eye coordination practice.

Just as talking pictures eclipsed silent movies, and personal computer games replaced smaller, less powerful hand-held versions that were all the rage just a few years ago, so, too will multi-faceted adventure games, hybrids, and strategy scenarios begin to overshadow the once-classic ladder games of our day. They won't fade away entirely. You'll just have variations on a few old themes.

Consider games like *Castle Wolfenstein* (Muse Software) or *Broadsides* (Strategic Simulations), with their strategic and tactical features, the planning ahead required to successfully beat your computerized or human opponent. Sure, you have to flee from the pursuing prison guards in *Castle Wolfenstein* (See Software Review, page 126), but you also have to pick up on clues placed in your path. Outwit, don't just outrun, the aggressor. It's a more elaborate version of the popular arcade game *Berzerk*—one of the most exciting shoot-'em-ups around. Success in *Broadsides* (See Software Reviews, February FAMILY COMPUTING) requires that you're quick on the stick, but you also have to build a ship, equip it, and track its path, keeping in mind variables such as wind direction and speed.

JAMES DELSON *is* FAMILY COMPUTING*'s games critic. He welcomes responses (pro and con) to issues and ideas contained in his column. Send them to him c/o* FAMILY COMPUTING, *730 Broadway, New York, NY 10003.*

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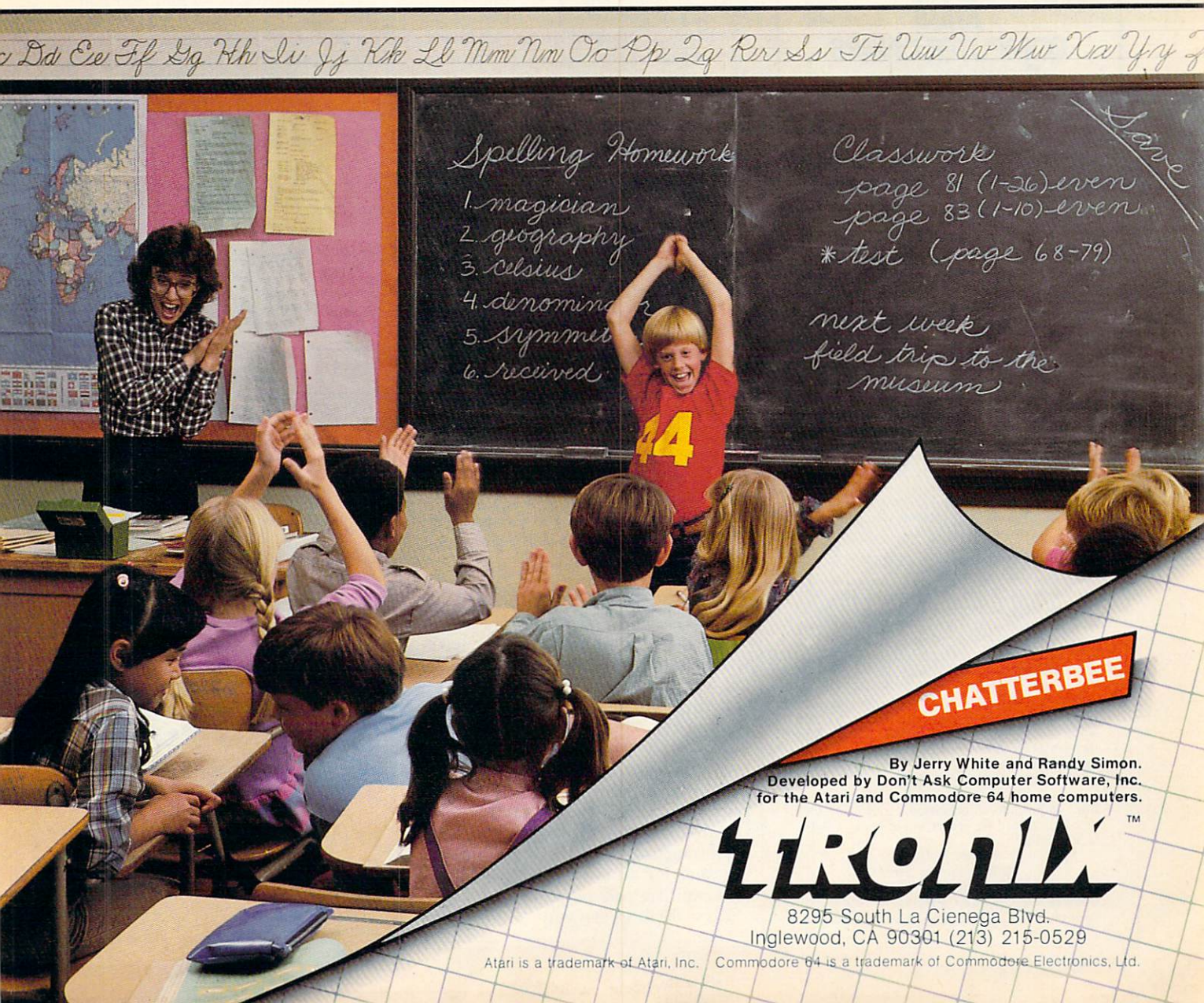

By Jerry White and Randy Simon.
Developed by Don't Ask Computer Software, Inc.
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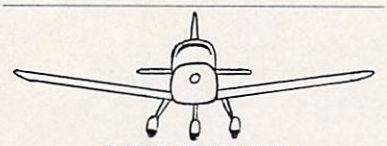

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GAMES

REDEFINING THE FIELD

Occasionally, a new arcade game comes along that is worth special mention; one that represents another step in an evolutionary ladder. These games redefine the field and make all the best competition obsolete. *River Raid* (Activision), *Spelunker* (MicroGraphicImage), and *Dino Eggs* (MicroFun) are three such clever, exciting games. They provide the usual thrills and side effects of their genre: that horrible/wonderful elation that comes with staying alive into another round of play, the stress that causes all but the most self-controlled of us to snap at anyone who breaks our concentration.

River Raid provides the immediate arcade experience. There's no other shoot-'em-up available that draws the newcomer in so abruptly. And it's carefully designed so that the better you get, the more difficult the challenge of making it up the river. [See my interview with Carol Shaw, the game's designer, p. 68.]

Dino Eggs and *Spelunker* are two ladder games that take the genre 10 steps forward. In the former, a delightful sense of humor highlights your mad attempt to rescue dinosaurs from a medieval plague. The clever animation and details, such as having to avoid the gigantic foot of a mother dinosaur, make it seem as if you're participating in a Fred Flintstone cartoon. *Spelunker*'s approximately 30 screens, and the variety of actions required of players (jumping, climbing, planting dynamite) demand that you're always on your toes. There's always something happening here.

These games are state-of-the-art great values. But in a field where innovation is so rapid that games are outdated before they ever reach the market, who knows where they'll be next year?

CLOSER TO MY DEFINITION OF FUN

Agreed, many arcade games, with their sharp graphics, are cute as all get out. They can offer hours of fun. But the same goes for *Conqueror* (Computer Software Associates; see Software Reviews, page 126), which has no graphics at all except for the lists of your holdings. (You play the part of a medieval monarch.) C.S.A.'s strategy program provides the opportunity to bring the family together for an evening of learning and exciting role-playing.

It's a thrill to see your score grow higher and higher as you reach new levels and previously uncharted screens in arcade games. But, frequently it's the same thing over and over. And if you master the game, that's it. Having lost its challenge, it'll end up in the drawer forever.

In *Conqueror*, or any number of other strategy games, however, you are called upon to use the thought processes involved in real life. I've found that the fun involved in this kind of use of the gray matter takes a lot longer to wear off.

By all means, arcade games do have their place. They're an unbeatable form of entertainment and relaxation, and I'll go into them more next month by surveying what's available in arcade adaptations for the home. But strategy, adventure, and hybrid games enhance the entertainment by taking it all one step further into the imagination, an unusual realm of experience, a marvelous world of fantasy, and closer to my definition of fun. FC

MANUFACTURERS MENTIONED:

Activision, 2350 Bayshore Frontage Rd., Mountain View, CA 94043; (415) 960-0410. *River Raid* available for Atari 400/800/1200XL, 16K (cartridge).

Computer Software Associates, 44 Oak St., The Silk Mill, Newton Upper Falls, MA 02164; (617) 527-7510. *Conqueror* available for Commodore VIC-20, 16K (cassette).

MicroFun, a division of Micro Lab, 2699 Skokie Valley Rd., Highland Park, IL 60035; (312) 433-7550. *Dino Eggs* available for Apple II/II plus/IIe, 48K (disk).

MicroGraphicImage, 12640 E. Northwest Hwy., Suite 410, Dallas, TX 75228; (214) 341-3791. *Spelunker* available for Atari 400/600XL/800/1200XL, 48K (disk).

Muse Software, 347 N. Charles St., Baltimore, MD 21201; (301) 659-7212. *Castle Wolfenstein* available for Apple II/II plus/IIe, 48K (disk); Atari 400/800/1200XL, 32K (disk); Commodore 64 (disk).

Strategic Simulations, 883 Stierlin Rd., Bldg. A-200, Mountain View, CA 94043; (415) 964-1353. *Broadsides* available for Apple II/II plus/IIe, 48K (disk).

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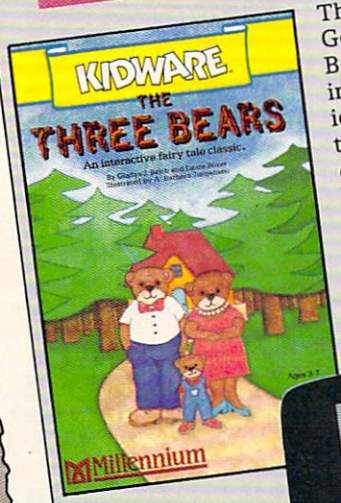
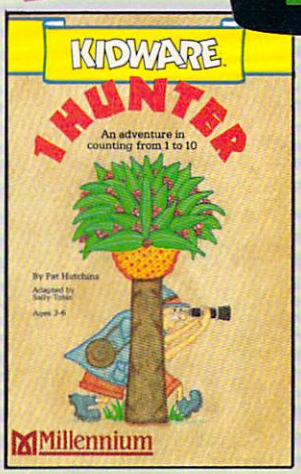


The classic fairy-tale of Goldilocks and the Three Bears comes to life in new interactive form. The graphics are bold and bright and the story unfolds as *your child* directs. Like a picture book, a tale for you and your child to read and share together. By Gladys J. Reich and Laura Boxer. Illustrated by A. Barbara Jurgensen. Ages 3–7. $39.95.

1 Hunter



Journey through a wondrous jungle with 1 Hunter, past colorful and playful animals, counting them as the Hunter goes. And when the story is complete, the program becomes a new counting game, reinforcing learned skills. This is the first program drawn from a book by Pat Hutchins, the well-loved Kate Greenaway Medal recipient, and is remarkably true to her style. Adapted by Sally Tobin. Ages 3–6. $34.95.

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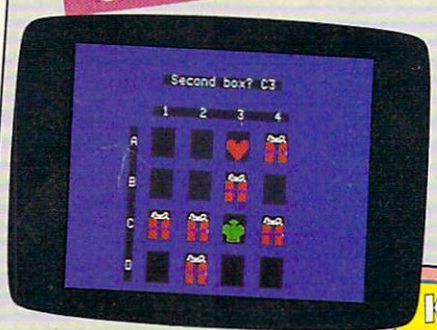

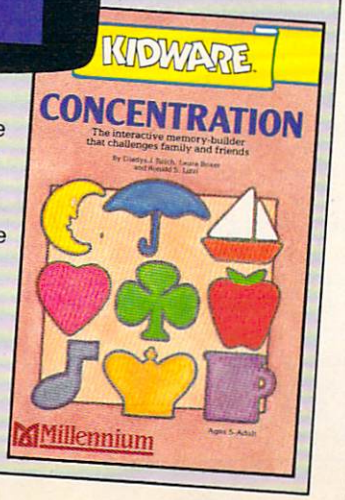

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HOME BUSINESS

A FATHER-SON REPAIR TEAM SETS UP SHOP IN THE ROCKIES

BY MINDY PANTIEL AND BECKY PETERSEN

At 4 feet, 4 inches, Joshiah Gordon doesn't appear to have the stature of a successful businessman. His $2-a-week allowance could hardly be used as collateral for a business loan, and his three years of elementary school education certainly haven't turned him into a top-notch technician.

His father, Geoffrey, however, still considers Josh an invaluable part of their five-year-old Atari repair service. The eight-year-old's greatest asset is probably his interest in computers. That mutual interest was the basis for their business venture and their single-parent/son relationship.

The senior Gordon built his first computer in high school and refers to himself as "the original whiz kid." The younger Gordon may achieve that level of expertise even sooner. Josh entered the world of computers at the age of three, when he dazzled his father with his game-playing prowess on an Atari 2600.

One afternoon, father and son stopped at a department store to do some browsing. Josh spotted a boxing game on an Atari, and with little effort was able to manipulate the joystick and master the game. Geoff was amazed at his son's dexterity with this particular machine because Josh had a lot of difficulty with their home *Pong* game.

A DYNAMIC DUO

Geoff purchased the machine on the spot, never dreaming the duo's shared interest in technology would eventually spawn a business. A couple years down the road, however, when Geoff's overzealous offspring broke the Atari's power jack, the idea for a business was born.

Geoff repaired the power jack himself after realizing there was no Atari service shop in the area. With a degree in information science, he was no stranger to computers. A similar incident shortly thereafter convinced Geoff to market his repair skills to the public. With Atari's blessing, he founded the Rocky Mountain Atari Service Center.

Getting approval from Atari headquarters was no simple feat. Geoff had to fill out numerous forms and get approval from an Atari representative. According to Geoff, "They [Atari] normally give this type of operation to a television repair or video shop, where there may not be electrical engineers, but there are electrical technicians." However, Geoff's history with technology, including

The Gordons tackle a hardware problem together.

PHOTOGRAPH BY ROB STUEHRK

MINDY PANTIEL *and* BECKY PETERSEN, *contributing editors to* FAMILY COMPUTING, *are now partners in a communications company and have between them experience in journalism, education, and computers. They are contributors to* Teaching and Computers *and* Electronic Learning *(both published by Scholastic Inc.). They are also the authors of* Kids, Teachers and Computers: A Guide to Computers in the Elementary School, *to be published by Prentice-Hall, Inc. this spring.*

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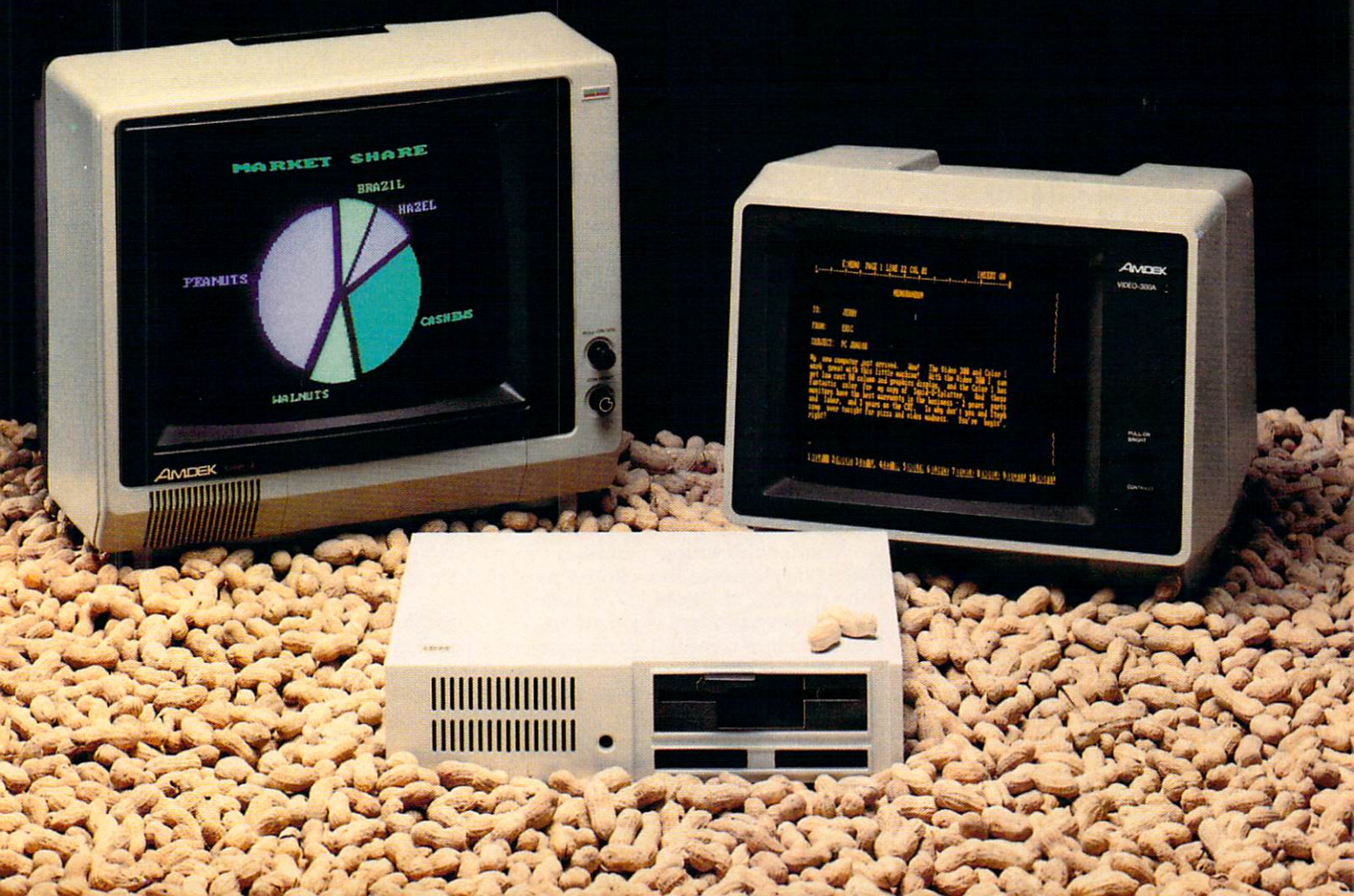

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HOME BUSINESS

one-and-a-half years of electronics training at a trade school, qualified him for the independent repair dealership.

A SUITABLE ENVIRONMENT

Next came finding an appropriate work space—one that met Atari's requirements, including a ground-level location, a separate work and reception area, and certain standard electronic bench test equipment. With all that in place, training sessions were the next order of business, and Geoff traveled to nearby Denver for a two-and-a-half-day crash course in diagnosing Atari computers. Held regularly, these classes are mandatory for all new repair representatives. Also, when new machine peripherals are introduced, service people are required to attend sessions to keep pace with the latest developments.

A TEAM VENTURE

Geoff views his new business as a way of being his own boss, as well as a way to strengthen his relationship with Josh, who has lived with him since his divorce eight years ago. The elder Gordon had had a mini business computer at home for four or five years, and Josh learned basic operations such as logging on and entering programs. By comparison, using an Atari was "child's play."

That introductory lesson in computers was five years ago, when Josh was three. Business today is strong, and the son's role has grown. Two afternoons a week, Josh takes two buses from his elementary school to the shop to work with his dad.

Generally, there is a three-stage repair process. First, they determine what is wrong with the computer. Using an Atari diagnostic cartridge, one or the other of the Gordons tests the main functions of the computer. Then the major repair work is done by Dad—although Josh is learning some of the simpler repair tasks.

Reenter the younger Gordon for what he claims is his favorite part of the process, the final stage, called the "burn-in." Basically, this involves using a computer extensively for three or four hours, because, according to Geoff, if a replacement part is going to burn out, it will generally do so in that period of time. To test a machine, Atari recommends several games that utilize almost all computer functions. Josh masterfully plays these games to check out a computer thoroughly before it is returned to a customer.

Geoff uses bonuses, such as a dinner at a favorite restaurant, as part of his reward system for keeping his pint-sized helper happy. During the rest of the week, Josh pursues other interests, such as soccer, football, scouting, and BMX (track bike) racing. But when duty calls, Josh answers quickly and responsibly, filling a valuable spot in his dad's enterprise.

"Here, Josh is learning," says Dad. "He helps customers, makes change . . . As a result, I can relate to him on a more adult level. It makes it easier on our relationship."

A COMPUTER COURSE

What does the future hold for the business-savvy Gordon family? More computers, of course. Gordon Senior continues to put his entrepreneurial leanings to work and has established the Rocky Mountain Computer Exchange Club. For $10 a year members have access, via their computers, to advertising in an innovative buying, selling, and trading market of hardware, peripherals, software, and services. Prospective buyers can request information free of charge through a bulletin-board system or with the help of a telephone operator. Nonmembers can buy ad space at an additional rate (from $5 for a quarter-page to $15 for a full-page ad).

Prior to setting up his repair business, Geoff spent several years helping other companies get off the ground by consulting minicomputer businesses. He stays involved in consultation through the Rocky Mountain Data Systems, a group of Colorado information specialists who exchange programming and technical tips and sell their services to individuals and businesses.

If all that weren't enough, wheels are already in motion for Geoff to expand his current business into a two-part operation to include computer sales along with his repair service. He hopes to have his franchise established in the next few months, and is busy with plans to redesign his storefront to accommodate Atari's selling requirements. Geoff has already devised a plan to include his junior partner. Josh will demonstrate the computers to customers. His probable sales pitch: "It's so easy—even a child can do it." FC

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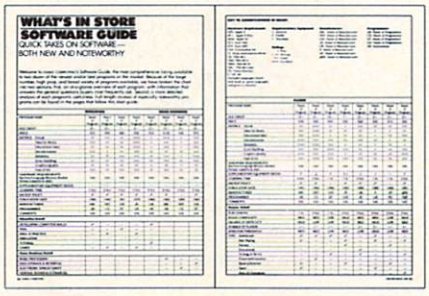
WHAT'S IN STORE
SOFTWARE GUIDE
QUICK TAKES ON SOFTWARE—
BOTH NEW AND NOTEWORTHY

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COMPUTING CLINIC

A COMMODORE COPY PROGRAM/ A SHOPPERS' CHECKLIST

BY WALTER KOETKE

My husband and I are semiretired on an income derived from rentals and contract sales. Is it possible and practical to use a computer in doing our bookwork and for figuring our taxes? If so, which machine is most efficient, practical, and inexpensive? Also, what software is applicable?

A. HOOKER
Newberg, AZ

To help decide, clearly define the bookwork you need to do—mailing lists, accounts receivable, accounts payable, projected maintenance costs, annual budgeting, etc. Just list those items with which you really need help. If projecting maintenance costs is a two-hour job each year, there is little to be gained by using the computer. If, however, maintenance projections take two full days each month, use of the computer just might give you three full weeks of vacation next year.

Although there are several programs specifically written for the real estate business, I suspect most of your needs could be met less expensively by a more general spreadsheet software package such as *VisiCalc*, *MultiPlan*, or *Lotus 1-2-3*. After your needs and budget are well-defined, take these suggestions to two or three dealers and request demonstrations as well as their advice. Once you've chosen a useful software package, find out what computers it runs on. That will narrow your range of choices. As for taxes, look for the article on tax software in our April issue.

I'm looking for a computer to use at home. I'm very interested in the Coleco ADAM, but the Apple computer seems to have the most software. Which computer should I buy?

S. RUSSELL
Simpsonville, SC

When selecting a computer, your steps should be:

1) Write down those jobs that you want the computer to do—word processing, accounting, filing, etc. Then ask yourself what type of entertainment you hope the computer will provide.

2) Determine how much you can afford to spend to attain these goals. Don't worry about the cost of computer hardware and software. Realistically look at your budget.

3) Read about software, then look at software that might meet your needs. I've long followed the practice of believing that software I can't use doesn't exist. I suggest you ignore promises, ignore new but unavailable products, and ignore anything else in the computer industry that you can't touch and evaluate for yourself.

4) By the time you've sampled the several pieces of software that satisfy the needs listed in step 1, you'll probably have identified the exact computer and peripherals you need. If the total cost is within your budget, you're all set. If the cost is out of range, either wait until your budget balloons, or go back to step 1 and reconsider your needs. Do not purchase a low-priced computer that can't meet your needs.

Why is there such a big difference in the price of disks? Is there really a good reason for using the expensive ones?

DAVID TIPMORE
Miami, FL

Price variations between two dealers are the result of many different factors. Within a single store, however, different prices generally reflect the different quality-control standards and testing done by the producers of the disks. More expensive disks have passed more stringent tests and are less likely to "crash" and lose your data.

I use the least expensive disks I can find for making backup copies of important data. Perhaps I'm pessimistic, but I always make two backup copies. On the other hand, I use an expensive disk whenever I expect the disk to get a great deal of use. I believe the more expensive disk is less likely to cause any difficulty under frequent use. This mixed approach has served me quite well and I would advise that any serious user do the same.

I have a Commodore 64 with a 1541 disk drive. How can I duplicate data diskettes that I use with a recently purchased data-base program?

G. STEINBERG
Lincoln Center, ME

Your question is a familiar one since the assortment of manuals available from Commodore don't seem to address this question in a straightforward manner. The question should certainly be addressed in the manual that came with your data-base software. If it was not, I suggest you call the company that produced the software.

The *COPY/ALL* program provided on the disk that was in the package with your disk drive won't be helpful. *COPY/ALL* was written for those with two disk drives rather than only one.

To make backup copies on the C 64, I used a program called *1541 Backup*. It's one of 30 programs in Commodore's Disk Bonus Pack ($19.95). The program was written to copy complete disks on a C 64 with a single 1541 disk drive. I suggest you contact your Commodore dealer as well as a local Commodore users' group to locate the program. FC

Send your questions, either machine specific or general, to:
FAMILY COMPUTING
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WALTER KOETKE *introduced computers into U.S. public schools, linking the Lexington, Massachusetts, system to a mainframe in 1964. In 1969 he worked with Seymour Papert, inventor of Logo, who brought that programming language to the same school system. He frequently lectures about computers to parents and educators.*

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IF YOU'RE LIKE MOST BUY A SINGLE

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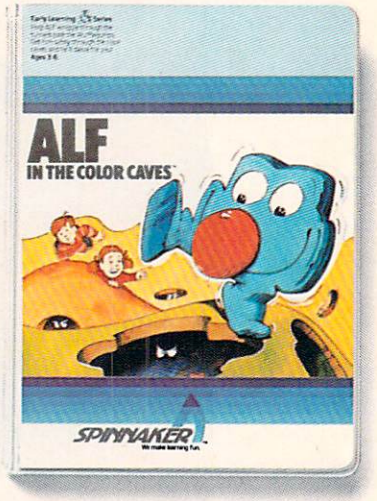
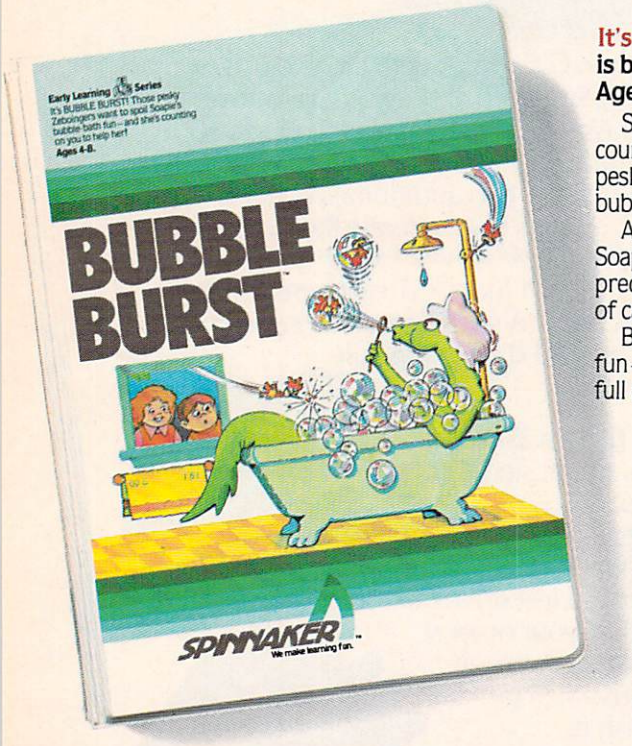
So if you're looking for a line of learning games that are as much fun to play as they are to buy, consider Spinnaker games. They're compatible with **Apple,® Atari,® IBM® PC, PCjr, Commodore 64,™ Coleco Adam™** and parents who don't mind their kids having fun while they learn.





It's new! BUBBLE BURST™ is bursting with fun! Ages 4 to 8.

Soapie the Sea Serpent is counting on your kids to keep the pesky Zeobingers from spoiling her bubble-bath fun.

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BUBBLE BURST provides hours of fun—and it comes with a workbook full of challenging projects.

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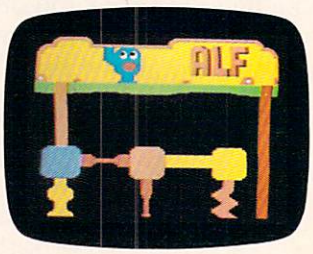
This cheerful game lets children guide lovable Alf through the color caves to the color room at the bottom where he dances to his own special music.

As kids maneuver Alf through the maze and past the Wufflegumps, they're improving their routing and prediction skills. And the enclosed activities workbook offers a rainbow of colorful projects!



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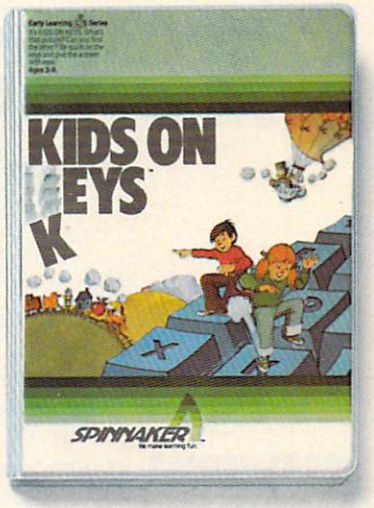
With DELTA DRAWING, even kids who have never used a computer before can learn to write programs and build an understanding of procedural thinking. It's easy, clear, and lots of fun!



KIDS ON KEYS™ helps kids catch on to letters, numbers—and computers. Ages 3-9.

KIDS ON KEYS offers children three terrific games that teach them the location of the letters and numbers while they have fun with the computer.

The games are fast and fun, with exciting sound effects and colorful graphics. It's a great way for kids to enjoy learning to identify numbers, letters, and words and associating them with images on the screen. And KIDS ON KEYS certainly do have fun!

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Disks for: Apple, Atari, IBM PC and PCjr, Commodore 64.
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The Computer: A New Tool for the Garden

A SEASONED BACKYARD GARDENER SHARES HIS FOOLPROOF TECHNIQUE FOR GREATER GARDEN PRODUCTIVITY.

BY JEFF BALL

MOST PEOPLE DON'T REALIZE HOW MUCH IS GROWN IN THE BACKYARDS OF AMERICA.

The computer can turn even a weekend gardener into a productive farmer. A small backyard patch of dirt and grass may be worth more than you know.

In the average backyard garden, every square foot produces the equivalent of 50 cents to a dollar in food. With the assistance of your computer and the right techniques, you can boost that output to $4 per square foot.

Unfortunately, nobody has figured out a way to get a micro to kneel down beside you and yank weeds. But your computer can perform a more important function: It can provide you with a personalized gardening approach—something no best-selling gardening book could replace. Your computer can help you develop a garden that suits your climate, your soil, your habits, your nutritional needs, and your dining pleasures. A forewarning, though: If you are a novice computer user *and* an inexperienced gardener, it is best to become adept at one of these skills before you combine them.

GETTING STARTED

I have a large suburban garden—it's 1,000 square feet and includes a few fruit trees, a small herb garden, and an 8- by 16-foot greenhouse. But whether you have 100 or 800 square feet, vegetables or flowers, you still need to plan your garden each year. Then throughout the growing season you must remember when to water, when to fertilize, and when to worry about the various bugs that materialize every year to chomp away your prize crops. All this takes time and energy. Your computer can save you both.

All you need is one of the many appointment-scheduling programs that are on the market today. These programs allow you to set up your calendar of appointments, anniversaries, birthdays, and other reminder items so that you can call up the schedule for your day or week on your monitor or print it out. (I use the *25:01 Time Scheduler/Organizer* by Softrend, Inc. Other possibilities are listed in the box on p. 40.)

Planning and managing a vegetable garden is nothing more than setting up and implementing a schedule of events.

DESIGNING A SCHEDULE

I have set up my garden schedule on a weekly basis. I know I will plant my first peas the first week of April, beans the second week of May, and fall broccoli the first week of July. I grow 35 different vegetables throughout the year, experimenting with one new vegetable each year. The decision of what to grow is based on my family's food preferences.

The novice gardener, however, should not plant more than 10 different items the first year. What should you plant? Plant all the things you like to eat. You can also set up your garden based on nutritional criteria. There are a variety of commercial software programs available to guide you. [*See p. 44.*]

The best gardeners make maximum use of every inch of space in their garden by employing succession-planting techniques. That means that when the peas are finished, they are immediately replaced with something else, like carrots. As soon as the early broccoli gets harvested, in go eggplants. Every square foot of garden is growing something throughout the entire season. The computer allows you to lay out a rough plan in the beginning of the first year. It can be modified during the season as you determine the actual timing of your crops. So, with these changes incorporated, you'll have a more accurate schedule for the following year. Every year you use this method, you get a personalized and customized succession-planting schedule that you probably couldn't get any other way. For the novice, there are numerous

JEFF BALL *is a writer living in Springfield, Pennsylvania. He has been a backyard vegetable gardener for 10 years. His latest book,* Self-Sufficient Suburban Garden, *is published by Rodale Press.*

Jeff Ball, the author of this article, uses his IBM PC to plan his suburban garden.

books on the market with basic gardening information—i.e., maximum use of land, growing seasons, and plant selection. [*See p. 40 for some suggested reading.*]

AWAY WITH ALL PESTS

Insects that attack your garden usually show up at the same time every year. If you can anticipate their arrival, you'll be better prepared to deal with them. So, in your computer garden schedule, you can include the arrival dates of your garden's primary invaders.

Using the growing times specified in your seed catalog, you can also plan when you want each vegetable to be ready to harvest, scheduling it around your August vacation, for example. If you make your own compost, you can also add to the schedule a monthly reminder to turn the compost pile. In other words, you can put into this home computer program all manner of planting, feeding, and maintenance schedules for the entire year.

The way to use this plan is to ask the computer to print out the week's schedule. It will show you which vegetables you should plant and which seeds you should start in flats for succession planting later. It will remind you to turn the compost and will note which plants should be fertilized. It will tell you to start looking for Mexican bean beetles, and it will remind you to cover the raspberries with netting to protect them from birds.

You may not have time to do all the things you hope to accomplish, but at least you won't have to keep all this stuff in your head—your computer will remember for you.

Now, here is where your computer gardening program becomes a management tool. Most of the scheduling software packages allow you to change the schedule and delete items. I usually print out a monthly schedule and make pencil changes on it as needed. I might find that the Mexican bean beetles came a week later than I predicted, or decide that I need to start my lettuce seedlings earlier next year. This is when I note it.

KEEPING A DIARY

As you go through your gardening year, your schedule becomes a customized garden diary. When you print it out in December, it becomes next year's plan. You can indicate the exact date the peas were ripe so next year you can compare what the seed packet said with what really happened. You can include how much of each vegetable you harvested each week so that next year you can plant just enough for your needs. You can note when the insects showed up so that next year you can more accurately predict their arrival.

Some scheduling software packages allow you to keep your data in the file and change the dates to conform with the new year. Other programs do not allow you to annualize your data.

YOUR COMPUTER . . . CAN PROVIDE YOU WITH SOMETHING NO BEST-SELLING GARDENING BOOK COULD REPLACE.

PHOTOGRAPHS BY LIZ BALL

UNFORTUNATELY, NOBODY HAS FIGURED OUT A WAY TO GET YOUR MICRO TO KNEEL DOWN BESIDE YOU AND YANK WEEDS.

SOME TIME AND TASK MANAGERS FOR YOUR GARDEN

Appointment-scheduling programs can do more than help you plan your business calendar. For the hobbyist—particularly the gardener—these programs can help save time and energy.

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Apple II/II plus/IIe
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Charlottesville, VA 22902
(804) 979-8194
An ideal program for schedule or project maintenance. User can file any number of projects or activities in a schedule tailored for a specific time period. Includes a scanning function and a feature for advance reminders of two important dates. Can print out reports.
IBM PC
$99, 64K

Timewise
ATARI HOME COMPUTER DIVISION
1312 Crossman Rd., P.O. Box 61657
Sunnyvale, CA 94086
(408) 745-2820
The "monthly calendar" function allows scanning and printing out appointments one month at a time. Files have room for notes, reminders, and updates.
Atari 400/800/1200XL
$29.95, 32K

Totl. Time Manager
TOTL. SOFTWARE
P.O. Box 4742
Walnut Creek, CA 94596
(415) 943-7877
User can file projects, browse through activities by date range or task, and add, alter, or delete entries. Program allows for organizing reports by project, sorting by ending date, and printing out in a choice of 56 bar-chart formats or six time-line periods.
Commodore 64 (disk),
VIC-20, 8K (cassette, disk);
both require datassette recorder
and printer
$25

VisiSchedule
VISICORP
2895 Zanker Rd.
San Jose, CA 95134
(408) 946-9000
Program breaks down complex tasks, evaluating the timing relationship between them and which aspects lie in the "critical path" and may affect the overall schedule. User can print out summary reports and predict the effects of delays. Can hold up to nine projects, with information about their prerequisite work, duration, and cost or profit.
Apple II/II plus/IIe, 48K; Apple III, 128K;
IBM PC, 64K
$300

Yard Improvement Planner
TIMEX COMPUTER CORP.
P.O. Box 2655
Waterbury, CT 06725
A program that helps user plan for seeding, fertilizing, and caring for plants. Includes eight predefined categories of tasks and 10 others for customizing. For example, 10 different areas of the garden can be inputted. Part of the program is a U.S. map displaying information on frost lines and climate conditions. User can key in the pH balance of the soil to find how much lime to buy, etc.
Timex Sinclair 2068
$19.95, 64K

BOOKS ON GARDENING

Gardening for All Seasons, *New Alchemy Institute (Brick House Press), paperback, $12.95.*

How to Grow More Vegetables, *by John Jeavons (Ten Speed Press), paperback, $7.95.*

Square Foot Gardening, *by Mel Bartholomew (Rodale Press), paperback, $11.95.*

but the computer schedule works just fine. Because we are worried about weekly activities the precise date is not so important. The key is to be able to use the schedule over again year after year, with revisions based on your actual experience.

A computer-assisted garden management system will become more effective and more helpful each year you use it. You will be able to keep track of which varieties of vegetable are most prolific in your backyard. Your skill at succession planting will improve each year, and your garden's yield will increase.

TAKE YOUR TIME

In the first year or two, learning to use a home computer for garden management will take a fair amount of time. It might take you three or four hours to lay out your first year's plan and enter the information on the computer. Early in your season, you might find it takes you 15 to 30 minutes a week to update your schedule. Later, as you get more adept, it will go more quickly. After a few years of experience, you will be able to put together the annual plan in an hour or so, and it will probably take less than 30 minutes a month to manage.

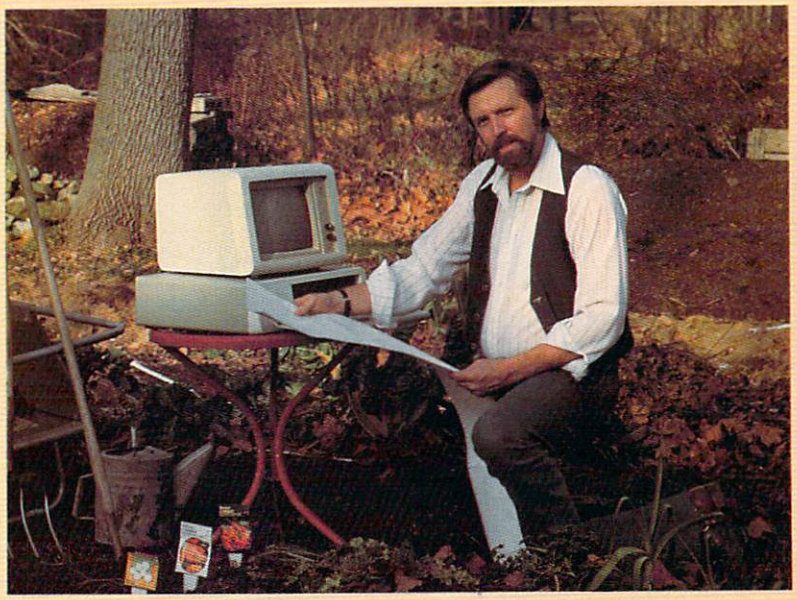
LOOKING AHEAD

You can expect to find other benefits in gardening production coming from your home computer. Some on-line services, such as The Source or CompuServe, have data banks of agricultural information. The Ortho Chemical Company is developing a data bank of information for vegetable gardeners, which should be available in the next year or so.

On a larger scale, an increasing number of county agricultural extension offices, primarily in the Midwest, are installing data services for local farmers with home computers. The farmer can check on local weather reports, insect infestations, and production reports, and receive advice on fertilizing, watering, and other topics. This type of service may be available to vegetable gardeners in a few years—you'll be able to get information on new varieties of vegetables, or warnings about serious insect infestations, all via your computer.

These data services may increase the productivity of backyard gardeners still further. Most people don't realize how much is grown in the backyards of America. In 1982, for example, 38 million gardening households produced more than $18 billion worth of food.

I believe that the home computer, together with new growing methods, will nearly double the production of food in America's backyards over the next 10 years without increasing the amount of land used. Every year I grow more food in my garden in less time. The planning and management assistance I get from my home computer is a major factor in my increased productivity. Although it still doesn't pull weeds, my computer makes sure the cabbages are always planted in time. FC



With the assistance of his computer, Jeff Ball has designed a personal approach to gardening. His garden's activity schedule can be modified annually to suit his family's pleasures.

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PERIOD ACTIVITY SCHEDULE FOR GARDEN

SUNDAY, MAY 1, 1983

 73   PUT OUT 10 CAULIFLOWER PLANTS
104   START CANTALOUPE, HONEYBUSH
136   PLANT SUNFLOWERS
199   FEED EARLY BEETS
200   FEED CABBAGE PLANTS
240   WATCH FOR GYPSY MOTH
251   PLANT SWISS CHARD, DARK GRN LUCULLUS
253   PLANT LACY LADY GREEN PEAS
255   PLANT ENDIVE, BROAD LEAF BATAVIAN
257   FIRST HOUSE WREN SHOWED UP
258   PLANT ONE SQUARE OF TURNIPS
259   PLANT ANOTHER SQUARE OF BEETS


MONDAY, MAY 9, 1983

 55   START 12 BROCCOLI PLNTS FOR SECOND PLNTG
201   PREDICT PICK FIRST CHINESE CABBAGE
202   FEED EARLY CARROTS


THURSDAY, MAY 12, 1983

173   NEW MOON
260   PLANT 2 SQUARES OF LETTUCE
261   PLANT SECOND ROUND OF ONIONS


SUNDAY, MAY 15, 1983

 75   PUT OUT 15 CELERY PLANTS
 83   PUT OUT 10 EGGPLNTS DUSKY & IMP BLK BUTY
 91   PUT SECOND PLANTING OF LEEKS IN GARDEN
 95   PUT OUT SECOND PLANTING OF LETTUCE
109   TRANSPLANT 6 PEPPER PLANTS TO GARDEN
111   TRANSPLANT YELLOW SQUASH
113   TRANSPLANT 9 ZUCCHINI PLANTS
114   START WINTER SQUASH, BUTTERNUT
117   TRANSPLANT TOMATOES TO GARDEN
120   PLANT GREEN BEANS, GREENSLEEVES
122   PLANT WAX BEANS, BRITTLE WAX
243   WATCH FOR ROOT MAGGOTS


TUESDAY, MAY 17, 1983

203   IN 82 STOPPED PICKING ASPARAGUS
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Soup's On-Line

A HARVEST OF HEALTHY SOFTWARE BRINGS ORDER AND AWARENESS TO THE KITCHEN

BY NANCY DILLON

Who hasn't dreamed about the possibilities of the computer in the kitchen? The terror that accompanies the prospect of converting soufflé for six to soufflé for 16 would disappear with the blink of a cursor. The computer would magically bring order to that gravy-splattered card file that's overstuffed with recipes you've been collecting for years.

As a simple recipe organizer, its uses may be limited. But with the right kind of software, the computer can do a lot more than just store recipes, especially when it comes to calculating approximate nutritional needs and shuffling about family members' assorted diet requirements. You may find your family growing more conscious of the foods it eats and the ingredients of a balanced diet. But before you delegate some of the work to a specific piece of meal-planning/nutrition software, you're going to have to do some prep work.

FOR THE PRAGMATIST AND PARTY PLANNER

First of all, you should determine what you want to accomplish with the program. The nutrition/meal-planning software category consists of extraordinarily sophisticated (and costly) diet analyzers and fairly elementary, but educational, menu-planning programs.

In the under-$100 range, a number of programs help homemakers plan meals and make sure the family is eating a well-balanced diet. These consist of pre-programmed files full of items from different food groups, together with listings of the vitamin, mineral, and caloric content of the foods. When you input what you've eaten over a specified period of time, the computer can calculate totals and deficiencies in your diet.

Another type of program offers less nutritional advice and more creative meal planning. Such a program allows you to select a file and view only dishes containing eggplant, for instance, or those designated as "easy to prepare" or "Granny's favorites." A terrific feature in one program provides for easy readjustment of ingredients to fit changes in serving size.

MORE THAN A MATTER OF TASTE

Buying nutrition and meal-planning software is a different process from buying a copy of the latest arcade game. These programs promise to help your family eat right, slim down, or enjoy an unusual dish. There are a fleet of considerations to keep in mind.

For simple recipe maintenance, a simulation card file may be all you need. Although they're not marketed for use in the kitchen, they are easily modified, and allow you to file dishes in whatever categories you choose.

If you opt for software specifically suited for nutritional advice and meal planning, consider the credentials of the person who prepared the program. Are they qualified to offer advice? What's the source of the information provided?

Of course, no program could possibly provide information about all the various foods your family eats. You'll have to live with some simplifications. In general, these won't detract dramatically from the overall educational or practical value of the programs.

If you can, sample recipe programs for the appeal and tastiness of their entries. Innovative recipes, dishes that draw from a variety of ethnic backgrounds or introduce you to new and different ingredients, may or may not be appreciated by family members.

CONVENIENCE IS THE KEY

The computerized recipe file or meal planner is supposed to make things easier. (Remember that gravy-stained card file?) One potential blessing is the way it could help you come up with a dinner idea or uncover that hard-to-find recipe. You should be able to scour a file for a recipe to utilize the spinach that's wilting at the bottom of your refrigerator, or instantly refer to a dish that you have designated as appealing to a finicky family member.

Try to determine how the program can be expanded or changed. It's important to be able to easily and quickly enter new information, diets, foods consumed, or particular food items. If you find a recipe in a magazine, you

NANCY DILLON *is a home economist with her own software directory company, Strictly Software. She conducts workshops evaluating software and computer graphics, and teaches nutrition education part time at Phoenix College, in Arizona.*

ILLUSTRATION BY RICHARD TIMPERIO

won't want to spend all afternoon typing it into the computer. By the same token, the program that promises to tell all about your dietary needs may take all day to update.

Another crucial convenience question is whether or not the program has a print option. Few kitchens make good homes for computers, and yours probably lives in another room. (Kitchens are crowded, chaotic environments to begin with, and the computer is often an open target for stray tomato sauce or cookie batter.) You want to be able to print out the recipes, shopping lists, and nutrition suggestions, to refer to them while preparing meals in the kitchen or doing the shopping.

OTHER DIVIDENDS

For the sake of ease of use and application, documentation is crucial, of course. Many diet or recipe programs go beyond the mere explanation of various steps by including additional references and cooking and health tips.

Documentation that goes above and beyond providing basic instructions enhances the educational value of nutritional software. You'll find that the learning potential of these programs is tremendous—especially with the more interactive nutritional-advice programs. People enjoy reading the vitamin, mineral, and calorie breakdowns of their diets almost as much as they enjoy reading the backs of cereal boxes. Traces of nutritional awareness are sure to rub off on the entire family, and you may find former junk-food addicts reaching into the fridge for fresh fruit!

PREP WORK

Obviously, the task of revolutionizing your culinary repertoire takes some time and effort. Diet software won't change your family's eating habits overnight. It may seem odd, but to use recipe-organizing software, you'll probably first have to organize your recipes. You'll have to label them explicitly so you can easily get them out of the computer in weeks to come. ("Top-left box, the one Charlie gave me last Christmas" will not do!)

Nutrition programs, as well, require that you enter specific information about the food you consume, such as caloric content and nutritional value, if it's not already stored in the program. This, too, may be more than you bargained for when you agreed to allow the computer in your kitchen.

But, like the favorite family dish, successful implementation of nutrition/meal-planning software requires a little extra time and energy. The payoff will be evident, measured in smiles and good health.

A NUTRITION/MEAL-PLANNING SOFTWARE SAMPLER

Here's a rundown of many of the diet/nutrition packages on the market. The programs mentioned here are geared primarily for the nonprofessional family audience.

Computer Chef, *by Norell Data Systems, available for IBM PC, 64K (disk), $49.95.*

With instructions and several recipes programmed on the "Chef" disk, and another disk with some 175 recipes, this comprehensive cookbook program includes many unusual and exciting recipe ideas. Dishes call for such high-protein, low-fat ingredients as tofu, sesame and sunflower seeds, and carob (a healthy alternative to chocolate). Files contain dishes such as TOFU QUICHE and CHINESE CHICKEN SALAD. Prompts and helpful feedback are lacking in this otherwise strong program that allows you to retrieve pre-programmed and self-entered recipes on the basis of ingredients, or keywords like HOLIDAY or SIMPLE.

Dinner on a Disk, *by Homemaker Software, Apple II/II plus/IIe, 16K (disk) and TRS-80 Model I, 16K (disk), $14.95.*

Twenty-one categories, with helpful designations such as FANCY BUT SIMPLE, CHOCOLATE, and LOW CHOLESTEROL, contain a very personal and tasty selection of dishes. Additional "chapters" include AUTHOR'S NOTES, FAMILY DINNER, and PARTY SUGGESTION (with hors d'oeuvres such as SHRIMP SPREAD and PARTY MEATBALLS). The recipe selection is impressive, with 11 dishes in the meatless category alone. Several dishes appear in more than one category, so it's easy to locate a recipe that you've used before, but the category of which you can't recall.

The Eating Machine, *by Muse Software, Apple II/II plus/IIe, 48K (disk), $49.95.*

Enter your age and sex, and the computer will estimate your nutritional needs. Input the foods you've eaten over the course of the day, and the computer will tell you how well you're meeting your vitamin, mineral, and calorie requirements. Four bar graphs illustrate and compare your nutritional intake to average standards. Put together by a team of professional nutritionists, this program relies on a pre-programmed file of 500 common foods. You can add approximately 200 entries, or delete items to tailor the selection more closely to your family's eating habits. An exhaustive 65-page booklet explains the many facets of the program, and serves as a fine primer to nutrition basics. This program is time-consuming, but rewarding.

Eat Smart, *by Pillsbury Company, available for Apple II/II plus/IIe/III, 48K (disk), $19.75.*

Simple to operate, simple in concept, this program analyzes the nutritional value of your meals for one day. Used widely in schools, it relies on a file of 136 foods and their pre-programmed nutritional values. A table of substitutions provided with the package enables you to slightly modify these limited selections. The program gives you a breakdown of your diet, checking for protein, vitamins A and C, thiamine, riboflavin, niacin, calcium, iron, and calories. It then makes recommendations for improving your eating habits. A fine starting

point for balanced-meal planning and diet awareness, its only drawback is the limited number of food selections.

Micro/Cookbook, *by Virtual Combinatics, distributed by Softsmith Corp., available for Apple II/II plus/IIe/III w/emulator, 48K (disk) and IBM PC, 64K (disk), $40. Commodore version distributed through Commodore.*

Select one of 150 dishes in this versatile computerized cookbook, using an ingredients classification, or general recipe index. The program's ability to automatically recalculate measurements for different serving sizes immensely simplifies party planning and prevents waste and spoilage.

While the ingredient index is extensive, there doesn't seem to be a real method to it. Mysterious ingredients, such as pignole, are never explained. (Fortunately, the recipe suggested chopped walnuts as a substitute.) The classification index is lengthy, boasting recipes for dishes from New England to the Mid East, but many of these categories contain but one entry. The vegetable category contains one lonely recipe for LEMON BROCCOLI. You may run into trouble with specific orders. A request for Chocolate Layer Cake made with eggs and shortening elicited the puzzling response of NOT USED AT ALL for both chocolate and shortening. Additional "chapters" for use with *Micro/Cookbook* contain recipes for soups and salads, desserts, and appetizers. Add your own recipes, and discard those for which you have no need.

The Model Diet, *by Softsync, available for Commodore 64 (disk); Atari 400/800/1200XL, 48K (disk); Coleco ADAM (cassette); $29.95.*

Designed to assist with weight loss for an otherwise healthy person, this program begins with a series of probing questions. Smoking and drinking habits, illness, headaches, as well as the usual age, weight, and height statistics, are all requested before the computer returns an appraisal of how much you should lose, and how long it will take. It analyzes meals and provides a breakdown of vitamin and mineral content on the basis of governmental nutritional research. Store your records and keep track of your progress. Simple to use, explicitly documented, *Model Diet* works well as a simple nutritional awareness package and basic meal planner.

What Did You Eat Yesterday? *by The Learning Seed, available for Apple II/II plus/IIe, 48K (disk), $39.*

Generally less flexible than other nutrition programs, this package calculates nutritional intake day by day. Values are calculated from pre-programmed breakdowns of some 600 items, foods ranging from McDonald's french fries to fresh summer squash and swordfish. This, like other nutrition software, has tremendous educational value although its practical applications are limited.

The Pizza Program, *by Gourmet Software, available for Apple II/II plus/IIe, 48K (disk); IBM PC, 64K (disk), $34.50.*

Described as a "meal suggester," and recommended only if you are at a total loss as to how to vary the foods you serve your family, this program helps you schedule menus for a period of days and weeks in advance. Each menu entry features a main course, starch, vegetable, salad, and dessert, drawn from a pre-programmed list or one you've modified yourself. The program does not supply recipes, and one of the suggestions recommends EAT OUT as a possibility. It's of limited use for those of us who have trouble figuring out what to prepare for dinner night after night.

Nodvill Diet Program, *by Nodvill Software; available for TRS-80 Models I/III/4 (disk), $69.95.*

A bit more difficult to use than many nutrition programs, this package contains a food list with nutritional breakdowns of more than 700 food items, based on information supplied by the Science and Education Administration. Input vital statistics such as height, weight, and sex, and the computer calculates the appropriate nutritional intake for your family members on the basis of the Food and Drug Administration's (FDA) recommendations for daily adult requirements. A scan feature allows you to "leaf through" food lists to put together square meals. Included are several sample balanced meals. FC

SOFTWARE MANUFACTURERS

Gourmet Software, 3583 Barley Court, San Jose, CA 95127; (408) 866-0887.

Homemaker Software, 960 San Antonio Rd., Suite #5, Palo Alto, CA 94303; (415) 856-7467.

The Learning Seed Company, 21250 N. Andover Rd., Kildeer, IL 60047.

Muse Software, 347 N. Charles St., Baltimore, MD 21201; (301) 659-7212.

Nodvill Software, 24 Nod Rd., Ridgefield, CT 06877; (203) 431-6449.

Norell Data Systems, 3400 Wilshire Blvd., P.O. Box 70127, Los Angeles, CA 90010; (213) 257-2026.

The Pillsbury Company, Pillsbury Center, Mail Station 3286, Minneapolis, MN 55402; (612) 330-8732.

Softsmith Corp., 1431 Doolittle Dr., San Leandro, CA 94577; (415) 430-2411.

Softsync, 14 E. 34th St., New York, NY 10016; (212) 685-2080.

Virtual Combinatics, P.O. Box 755, Rockport, MA 01966; (617) 546-6553.

Users' Groups: Strength in Numbers

WHERE DO NOVICES AND EXPERTS FIND ANSWERS TO THEIR COMPUTER PROBLEMS? THROUGH ONE OF THE HUNDREDS OF MACHINE-SPECIFIC USERS' GROUPS ACROSS THE COUNTRY.

BY LESTER BROOKS

ATLANTA'S ATARI CLUB HAS MORE THAN 430 PUBLIC DOMAIN PROGRAMS, RATED ON A SCALE OF 1 TO 10.

When his computer system crashed one day, Haynes McFadden was panic-stricken. He keeps the books for his Atlanta graphic-arts business on disks and was sure he'd lost six months of the company's accounts receivable and records. As a last resort, he took the destroyed disk to the Atlanta Atari users' club. The members of its Disk Utilities Group love to tinker with operating systems. With no clue to the form of the program and nothing definite to work from, they rebuilt the disk directory and salvaged the data.

"The work necessary to reconstruct the data would have been astronomical," says McFadden with awe. "But they retrieved it and allowed me to recapture the 'lost' information. Now, whenever I have a problem, I ask another member."

As president of Contact, the Atlanta Atari users' club, McFadden has 140 other active members he can call for help. And that, as he (and thousands of other members of hundreds of other computer clubs around the country) will tell you, is a primary reason for starting and/or joining such a club.

Computer clubs are as fresh, dynamic, and fast-growing as the microcomputer industry itself. Because they are organized by the owners themselves, they respond to real needs and interests. It is amazing how many things users' groups manage to do.

A computer club typically holds meetings, operates a library of programs on disks, and sends a newsletter to members. In addition, most computer clubs have subgroups of members who meet and exchange information on a particular subject. Called Special Interest Groups (SIGs), they focus on the specific concerns and interests of members.

Club dues are modest—averaging $15 to $20 per year—though some clubs have none. The dues are used to rent meeting rooms and cover newsletter costs.

Local computer stores sometimes help start a club or serve as a meeting place for one, but they are seldom involved in running it. Computer manufacturers have steered clear of organizing clubs, although they support them in many ways.

FROM EIGHT TO 80

Who joins? Young and old, men and women, and, increasingly, entire families. "We now have 300 member families, representing 800 users," boasts Joel Casar, president of the Pittsburgh Commodore Group. "In some cases there are seven users in one family!" At this time, in users' groups around the country, men outnumber women about four to one. Ten percent of the members usually are teenagers.

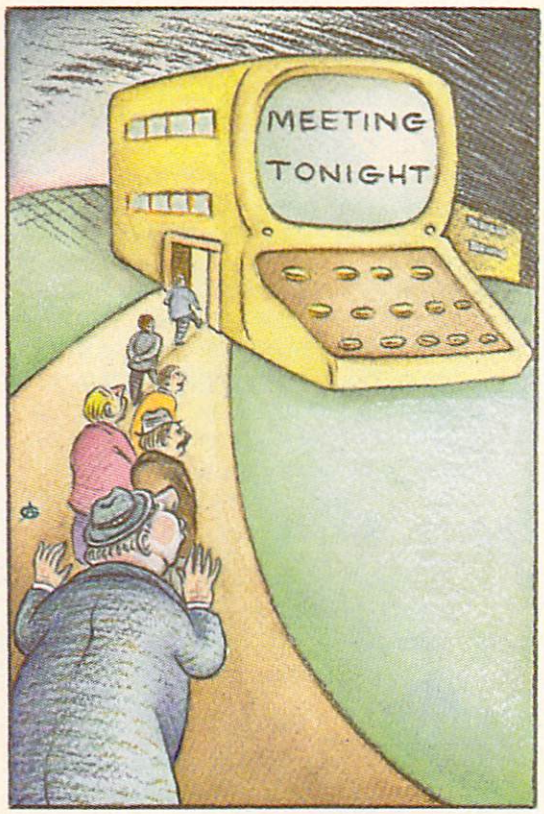
Clubs meet locally at a place and time convenient for the majority of members. In Hays, Kansas, the High Plains Computer Club meets every Wednesday evening in the Fort Hays State University Physics Department. But, by and large, weekly meetings are unusual. The First Atari Club of Spokane (FACS) used to meet twice a month at the Bits, Bytes and Nibbles computer store, but has cut back to the first Tuesday of each month.

Most computer clubs meet one evening a month. But the Pittsburgh Commodore Group (PCG) meets on a Sunday morning in the Duquesne University Mellon Science Hall (the club's treasurer and librarian are both instructors at the university). "We found the time was

LESTER BROOKS, *a veteran freelance writer who lives in New Canaan, Connecticut, specializes in business and computer topics. His last article for* FAMILY COMPUTING *was "Automatic Pilot," in the December issue.*

best for a majority of our members," notes Casar, "even though it means the priests and ministers who are members can only take in the afternoon portion of our meeting."

Some users' groups question whether they should meet in a retailer's store. They believe



it's an implied endorsement of that store's products, and inhibits free discussion and criticism of them.

The Houston Area League of IBM PC users' (HAL-PC) moved its meetings to a local hotel where they were able to negotiate a special room fee. HAL-PC's Ralph Roddy, Jr., stresses that this "neutral location" makes it possible for all local computer retailers to support the users' group.

ON THE AGENDA

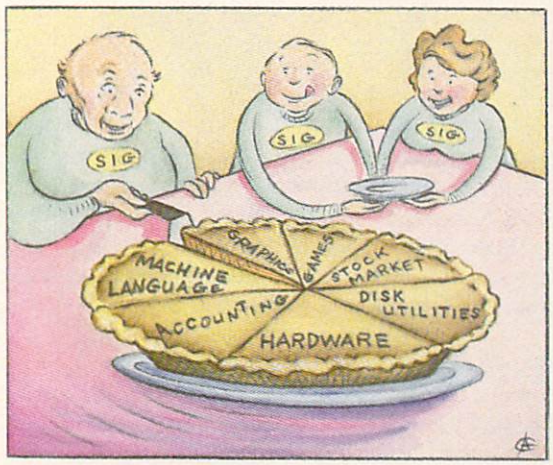
Spokane's First Atari Club meeting is typical in its format. President John Gardner reports on new information received from the manufacturers and newsletters from other users' groups. "Then there's a lecture or demo," he says. "Recently the club's vice president, Mark De Forest, made a presentation on graphics—plotting, formatting, and formulas. We've also had BASIC classes (we've run through the whole subject), and how to set up and access disk files—and many other subjects. Then, after the lecture, we take questions."

Next on the Spokane club's program is a demonstration of software from local computer stores. "And the fourth part," says Gardner, "is when we break up into groups with common

interests or get together and exchange 'war stories.' "

The Pittsburgh Commodore Group adds another wrinkle—it videotapes its speakers. Says Joel Casar, "If you come late to the meeting and want to see the speaker you missed that day—or two months earlier—you'll be able to pull the cassette and sit through the lecture." He emphasizes that PCG strives to keep its meetings nontechnical. "We have people with no background in computing (I have none), who buy a system, get it home, plug it in, and ask, 'Now what do I do?' We're trying to accommodate them as well as the members with high-tech backgrounds."

Atlanta's Contact club starts its meetings at Chuck Tintle's Versatile Video shop by distributing the latest club newsletter. Then there's an explanation of programs written in



the publication. Afterward, there are demonstrations of equipment, programs, or programming by members.

SIGs

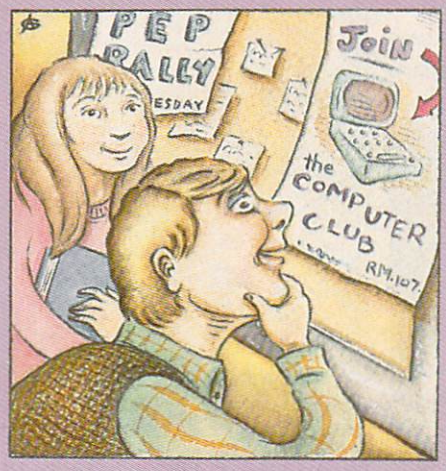
If meetings purposely deal with topics of broad interest to members, their offshoots or subgroups concentrate intensely on specifics. These special interest groups tailor their activi-

THE PITTSBURGH COMMODORE GROUP TRIES TO CATER TO THOSE WITH NO COMPUTER EXPERIENCE AND THOSE WITH HIGH-TECH BACKGROUNDS.

ILLUSTRATIONS BY AL GOLD

STARTING A SCHOOL USERS' GROUP

Computer users' groups are not an adults-only activity. In fact, starting a group, or computer club, at the junior or senior high school level is natural. In many cases, there are already computers housed in a central location, and the school building is a perfect gathering place for young computer enthusiasts. In order to get this kind of venture off the ground, however, a resourceful teenager has to be ready to handle all the organizational red tape. This self-appointed organizer should enlist some friends to help accomplish the necessary tasks.



CHECKLIST FOR SUCCESS

In order to start a well-run computer club, it's a good idea to answer some all-important questions long before the first meeting is ever called. Use the answers to the following questions to serve as a framework on which to build a successful school users' group.

1. What is the purpose of the group? Most teenage participants in this kind of club probably have a fairly good level of computer knowledge. Therefore, what the group's specific objectives are will have to be decided. For example, will the group concentrate on the kinds of computers available in the school, or will additional types of computers, which may be used by participants at home, be included? Should members focus on a specific programming language such as BASIC or PASCAL? Is one goal to act as a support group to help fellow computer operators with general programming applications and debugging? Remember: The most successful organizations of this kind have some direction and offer good resource networking possibilities for their participants.

2. Who is eligible to join? Membership should be open to anyone. Everyone should be invited to join, regardless of their level of computer knowledge. However, the number of computers available will determine how many people can actively participate at one time. One solution is to set up a rotating schedule.

3. Who will sponsor the group? No school administrator will grant students permission to use computer equipment without a responsible adult in attendance. Therefore, it's up to the club organizers to find a faculty member who is willing to serve as group sponsor and attend all the meetings. Whatever the circumstances, it should not be the sponsor's responsibility to establish guidelines or run meetings.

4. Where will the meeting be held? The obvious answer is in the school's computer lab. However, this involves getting permission from the principal or person in charge of extracurricular activities. Administrators are apt to be more willing to grant permission to individuals who show they are mature enough to use the school's computer resources responsibly. It is important, therefore, when meeting with an administrator to have all the details worked out. Be prepared with a written report that outlines the goals of the group, how often it will meet, who will be in charge, and approximately how many members it will have.

5. How will other students be informed? All the school's publicity methods should be used. Take out ads in the school newspaper, hang posters in strategic locations, and include information in the daily school announcements.

6. How will the agenda be determined? To discover the needs of the group, develop a questionnaire aimed at finding out what members hope to get out of the club. Do they want to learn new languages? Exchange software? Discuss computer career opportunities? Invite guest speakers? It's also a good idea to ask questions that will pinpoint the ability levels of participants.

THE FIRST MEETING

When the groundwork is completed, it's time to hold the first meeting. Some kind of leadership is essential if the group has either a very formal organization with elected officers, or a looser—drop-in whenever—format. How much direction the group needs will depend on its goals, and, along that line, several issues need to be addressed.

Determining dues. Dues should be based on the goals of the group. For example, if the group plans to establish a newsletter, dues are a way to cover printing and paper costs. Money for supplies such as paper and extra disks can also come out of this central fund. Be sure to elect a trustworthy person as treasurer.

Starting a software library. A key consideration will be where to house the software and who will be in charge of it. Elect a club member to handle check-in and checkout procedures, as well as to see to the safekeeping of the software. If there's a secure place to lock things up in the school building, the software should be stored there. This will guarantee its availability at each meeting, whether or not the person in charge attends. Members should be reminded that the purpose of a software library is *not* for copying or distributing copyrighted material, which is against the law.

Agenda items. Once the various levels of the group members are established and all expectations are voiced, agenda items should be set to meet the needs of users at all ability levels. Members who are new to computers will find it especially helpful if time is allotted when more advanced computer users can lend them a hand and answer their questions.

Contacting other users' groups. Devise a plan to seek out other schools in the area that have users' groups or computer clubs. If possible, set up a newsletter and software exchange. It's a great way to expand the club's resources. It might also be worthwhile to attend each other's meetings from time to time to see how other groups operate and to learn new ideas for the club back home.

—MINDY PANTIEL AND BECKY PETERSEN

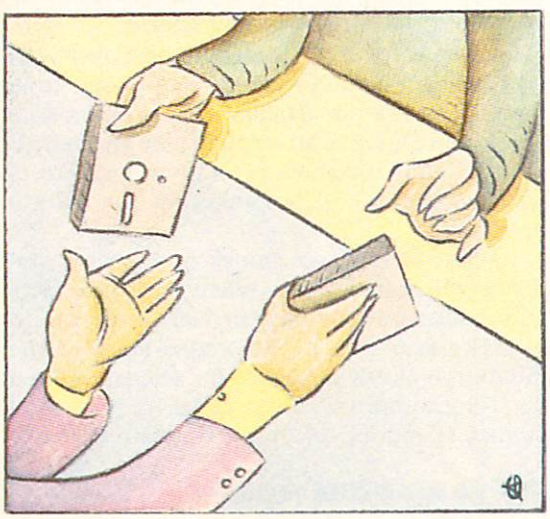
ties to members' needs and wants. They often meet in the home of a group member.

Atlanta's Contact club has SIGs for games, machine language, disk utilities, and hardware. Houston's HAL-PC has 15 SIGs, dealing with subjects ranging from accounting to telecommunications and including BASIC, beginning users, and graphics, medical, and stock market software.

When Earl Greene, Jr., president of the Sun Coast Apple Tree club (SCAT) in St. Petersburg/Clearwater, Florida, polled its members, they listed half a dozen special interests. They've since clustered into one SIG, however. "They all seem to be hot on modems at the moment," Greene observes. "There are several bulletin boards in the area, which may explain it."

Carrying the SIG idea one step further, the Pacific Northwest IBM PC User Group in Bellevue, Washington, runs a "Product Hotline" service. It consists of a roster of members who are willing to act as resource persons concerning specific programs or equipment. For instance, the roster lists (among many) Sandra Stowell for MS-FORTRAN, Delmar Fadden for *Home Accountant+*, and Dale Chase for *Volkswriter*, along with their telephone numbers and the times they can be reached.

The 150 members of the five-year-old Fairfield County (Connecticut) TRS-80 Users Group (FCUG) have three very active SIGs. One works with *VisiCalc* and other spreadsheet software. A second meets every other Thursday to go over advanced assembler topics. The third group concentrates on data bases. "When I was meeting with them," recalls FCUG news-



letter editor Alan Abrahamson, "we were trying to make a data base that would be the end-all and be-all—but I doubt there is or ever will be such a thing."

PROGRAMS, PROGRAMS

A major attraction of every computer club is its library, or "software exchange," of utility

FREE SOFTWARE?

"Freeware" and "public domain" software are not the same thing, but they are close enough in concept to confuse a lot of people. The difference is in the copyright.

Almost all commercial software is copyrighted, meaning that it's illegal to reproduce it without the permission of the copyright holder. If you make a copy of a commercial program and give it to a friend, you are violating the copyright law. (Many software publishers, of course, allow you to make a backup copy for your own files.) Most people don't realize that if you reproduce and distribute a program from a computer magazine you are also breaking the law. The magazine holds the copyright.

Freeware is also copyrighted. And, despite its name, it's not really free. Freeware is a marketing idea originally developed by Andrew Fluegelman, who produced *PC-Talk*, a communications package for the IBM PC. While Fluegelman holds the copyright, he encourages people to make copies and share them with friends. If you like the software and plan on using it, you are encouraged to send Fluegelman a "donation" of $20–$50.

PC-File, a data-base program for the PC developed by Jim Button, is another freeware package. However, users' groups are being asked by the copyright holders not to distribute these freeware packages, because users' groups generally charge a fee for the reproduction. Thus, they are not really free samples, which is what the developers have in mind.

Rumors are circulating through users' groups that similar freeware packages are being designed for computers other than the IBM PC.

Public-domain software is not copyrighted. Public-domain programs have been written by people who choose to make them available to anyone who wants to use them. They range from the very simple to the very sophisticated. And, while they are not free, they are usually very inexpensive. The fee is generally the cost of reproduction, or $3–$5.

Thousands of public-domain programs are available. Some computer manufacturers [*see phone numbers and contacts in "How to Find Your Nearest Computer Users' Group"*] make public-domain software available, but the best source is users' groups. The New York Amateur Computer Club (P.O. Box 106, Church Street Station, New York, NY 10008) has the largest collection of programs and is constantly expanding its catalog.

—JEFF BALL

MEMBERS OF THE SUN COAST APPLE TREE CLUB IN ST. PETERSBURG, FLORIDA, HAVE CLUSTERED INTO ONE SIG: "THEY ALL SEEM TO BE HOT ON MODEMS."

FINDING YOUR NEAREST USERS' GROUP

1. Start by asking the people at your local computer store. They're usually the first to know of local users' groups—and often start or sponsor them.

2. Call your local library, high school, or community college. The computer teachers are usually members and keep up-to-date on what computer groups are meeting in the area.

3. If you are a Source or CompuServe subscriber, check the bulletin boards on these services. You'll find many listings of computer clubs—perhaps one in your vicinity.

4. Major computer magazines list users' groups from time to time and print news about their activities.

5. See if there's a toll-free number for your computer's manufacturer (see below, or dial (800) 555-1212 for toll-free information) and telephone directly to ask.

6. Write or call the following:

Atari, Mr. Earl Rice, Marketing Manager, Atari, Inc., 60 E. Plumeria Dr., San Jose, CA 95134; (408) 942-6830. (Atari's toll-free number is (800) 538-8543.)

Commodore Business Machines, Publications Department, 200 Wilson Dr., West Chester, PA 19380; (215) 431-9100.

Hewlett-Packard, 1000 Northeast Circle Blvd., Corvallis, OR 97330; (503) 757-2000.

IBM Computers, check at your local IBM Product Center or store where you bought your IBM computer.

International Apple Core, 908 George St., Santa Clara, CA 95050; (408) 727-7652.

North Star Computers, Inc., 14440 Catalina St., San Leandro, CA 94577; (415) 357-8500.

Radio Shack, check at your local Radio Shack store, see copies of *TRS-80 Microcomputer News*, One Tandy Center, Fort Worth, TX 76102; (817) 390-3011.

Texas Instruments Computers, P.O. Box 53, Lubbock, TX 79408; (800) 858-4075.

Timex Sinclair Computers, P.O. Box 2655, Waterbury, CT 06725; (800) 248-4639.

or public domain programs. [*See "What's Really Free?"*] Essentially, these are tapes or disks containing programs that club members may copy at little or no cost.

Atlanta's Atari club has more than 430 public domain programs. Its catalog lists the languages they're written in and the number of disk sectors they require, and rates them on a scale from 1 to 10. In addition to games, typical subjects include: a calorie counter's aid; *Weight Watchers' Delight*; *Budget Manager*; birthday and Christmas card systems; math, typing, and speed-reading programs. Others deal with music, graphics, data files, and programming techniques.

The Atlanta club keeps two sets of all disks at the store in which they hold meetings. If club members' dues are paid up, they can check up to three disks for three days, leaving a $5 deposit and $1 rental per disk. They're free to copy them. If they're late in returning a disk, the penalty is $1 per day until the $5 deposit is used up. If they don't bring the the disk back, they lose their deposit and library privileges.

Many clubs allow members to copy disks during their meetings. St. Petersburg's SCAT club has some 60 disks, many of them from the International Apple Core, an umbrella club of Apple users. During meetings, members use their membership cards to check out one disk at a time and copy it on one of the computers brought to the meeting. When a member returns a disk, he or she can check out another and repeat the process.

Still another system is used by Spokane's First Atari Club. Members bring a formatted blank disk to a meeting, specify the library disk they want copied on it, and pick up their copy at the next meeting—without charge.

Clubs constantly expand their disk libraries. They get some programs and games from manufacturers or dealers (the Commodore Education Series is an example), or an umbrella club. Many members get a great kick out of creating games and programs for the club library.

Most clubs swap games and utility programs with other clubs. When Joel Casar was on vacation last summer, he visited the Toronto PET Users Group and traded some of the Pittsburgh club's programs for selections from the Toronto library. Other clubs trade by mail or via a telephone line–bulletin board hookup.

SPREADING THE WORD

Almost all user groups publish newsletters. Often they are prepared by their members on their computers, then photocopied and mailed out. A few clubs, however, have elaborate newsletters that are truly small magazines, complete with printed copy, diagrams, artwork, and photographs. Many newsletters carry advertisements to help cover their costs.

Newsletter contents vary, as you might ex-

pect. But basically they keep members up-to-date on club activities and events, describe new programs available in the club's library, and may include brief reviews of new software.

The Houston HAL-PC newsletter is a fat 20 pages, including announcements, listings of new programs in the library, and reports on SIG activities. In a recent issue Nelson Ford reviewed and evaluated a new software program (*Viz.A.Con*), and Randy Spurlock's *Program Protect Documentation* in BASIC was printed in full.

Alan Abrahamson's "Novice Nook" is a regular column in the FCUG newsletter. In one of them, Abrahamson reminisced about computers in the "Dark Ages"—the 1950s. He then jumped ahead 30 years, telling readers how to use the TRS-80 PRINT command in BASIC.

After the big Chicago Comsumer Electronics Show in June 1983, the Atlanta Atari club's newsletter printed an extensive report about it.

Even more important to club members, the report provided a point-by-point comparison of the features of new Atari models and competing hardware.

Some newsletters include members' classified ads for their used equipment. Others print job opportunities. Still others pick up items from other newsletters and pass on hot information (about a hazard in a program, for instance) to their readers.

INSIDER PRICES

Some clubs actively seek discounts on the purchase price of hardware or software. Others do not. Pittsburgh's Casar reports that his club's sustaining sponsors (retailers) offer discounts to members. "When a new monitor came out, one sponsor offered it for $30 below mail-order house prices."

"We try to avoid group purchasing," says Atlanta's McFadden. "If we do purchase, we offer Versatile Video a chance to match the

offer and it always has so far. We were offered a Voice Box at $125 and store owner Chuck Tintle offered it at $85 after he called the manufacturer."

SCAT in St. Petersburg buys supplies such as printer ribbons, labels, floppy disks, and software at a discount from local dealers who are club members.

SOME CLUBS ACTIVELY SEEK DISCOUNTS ON THE PURCHASE PRICE OF HARDWARE OR SOFTWARE.

SPECIAL ATTRACTIONS

Many clubs hold fairs or expositions in cooperation with other users' groups. These fairs offer opportunities for display of hardware and demonstrations of software programs, plus lectures and even seminars. The Connecticut Fairfield County Users' Group combined with the Westport Apple Computer Users' Club in a one-day fair at a local nature center. It was so successful that it is now an annual feature.

The giant Boston Computer Society holds clinics every Saturday from 10 a.m. to 2 p.m. in its offices. There's a different topic every Saturday (e.g., financial software, word processing, hardware). Resource consultants are on hand to answer questions and help with files, magazines, and computers. Even nonmembers may make an appointment for consultation (at $8 a visit; members pay $4).

Computer clubs sometimes make field trips to computer installations. The Hays, Kansas, Atari club toured the Fort Hays State University's computer center. Atlanta's Contact club has gone through the Hayes modem factory and visited the Six Flags amusement park to see how its robots are controlled by computers.

But some of the strongest attractions of computer clubs are the least tangible. FCUG's Alan Abrahamson believes that most people join, looking for camaderie and people with similar interests.

Do they find them?

Absolutely, says Abrahamson firmly. "I have 20 hard-and-fast friends from this group from the last four to five years." FC

Rendezvous with a Robot

YOUR DREAM 'DROID MAY BE JUST AROUND THE CORNER.

BY BETSY BYRNE

AS AN EDUCATIONAL TOOL, TOPO EARNS HIS PAY—HE'S DEFINITELY NOT A TOY.

Everyone has probably fantasized about living with a robot. Life would be so easy with a robot like the Jetsons' maid, Rosie, around to open doors, scrub floors, and send the kids off to school with nothing more than the touch of a button. We all have our ideas of the "dream" android, whether it's Rosie, R2-D2, Gigantor, or Robbie the Robot. Refined robots such as these are not available yet, but the robotics field is progressing so quickly that they are not too far off in the future. The robots currently on the market can perform simple functions with programmed commands. While they are not the "dream" robots, they can *provide an educational experience. That's what the Byrne family of New Mexico discovered when Topo, a robot from Androbot, Inc., came to stay with them. Unfortunately, this $495 Topo model is no longer available. A more efficient Topo with voice capabilities, a built-in memory, and other extras at a steeper price ($1,500) has replaced the earlier version. Smaller models with less expensive price tags are available from other companies for those who want to live their robot fantasies today.*

We have a robot living in our house. He doesn't scrub floors or wash windows, but we love him just the same. He can't talk to us or hear us speak, but that doesn't stop Molly—who is five—from telling him all about her day at kindergarten. He doesn't boast sophisticated sensors, but it sure hurts his tummy if he bumps into the wall, according to my seven-year-old, Timmy.

Who is our houseguest? He's Topo, a creation of Androbot, Inc., a California-based company that designs robots for schools and homes. The only thing he really does is follow directions beamed to him through his radio antenna. He'll roll forward or backward a designated number of spaces, or will turn right or left a designated number of degrees. He can be programmed in either BASIC or Logo.

His radio control plugs into expansion slot number five of any Apple (II, II plus, IIe), and seems almost identical to the twins' (Timmy and James) radio-controlled Porsche from Radio Shack. When we got Topo he was selling for about $495, without the Logo software, and one might question spending so much on something that at first appears to be little more than an overgrown toy. (The new Topo model, with its $1,500 price tag and promotional campaign, is targeted to educational institutions.)

A DREAM ROBOT?

When Topo was wheeled through the door by the deliveryman, I sat and stared at the large box dominating my living room. I wondered what on earth my family and I thought we were doing, inviting an alien being into our home—a being that, from all reports, would not even clean up after itself, let alone the kids. My dream robot, as I had explained many times to my husband, Dan (an electronics whiz who works for General Electric), would move majestically through my world, scooping up dirty laundry. When it passed by, peanut butter smears would disappear from doorjambs as if by magic, and unruly children would be charmed into bed by its wondrous stories. Oh, well, I sighed, maybe next year. So I set about unpacking our newest "computer accessory."

A computer accessory is exactly what Topo is, his good looks and charming personality notwithstanding. He comes with the aforementioned antenna (a transmitter), a battery charger, a hefty looseleaf owner's manual, and Topo-control software. Also included is a foam perch for Topo to, well, *perch* on while being calibrated. (More on that later.) We had also ordered Terrapin Logo for the Apple (another $150) and Topo's Logo extension ($59), which includes a disk and documentation for programming him with Logo. Total cost: $704.

I had barely finished unpacking Topo when the family descended and introductions began. My husband immediately took Topo's manual and, with the briefest of greetings to our little guest, headed for the computer. Beth, who's 14, said something like: "What's-that-oh-the-robot-did-I-get-any-phone-calls?" and dis-

BETSY BYRNE *frequently reviews software for* FAMILY COMPUTING. *Her last article, on parent-teacher relationships, appeared in the Home-School Connection in the February issue.*

PHOTOGRAPHS BY TOM O'BRIEN

B.O.B.
TOPO
TOPO
TOPO

A COMPUTER ACCESSORY IS EXACTLY WHAT TOPO IS, HIS GOOD LOOKS AND CHARMING PERSONALITY NOTWITHSTANDING.

appeared in the direction of her room (and phone).

No disappearing for the other three, though! Timmy, James, and Molly had their own ideas: "Can he walk to school with me? And can he be the baby of the family now, Mom? I'm older than him, right?"

After extracting James from Topo's box, where Timmy had stowed his twin brother for shipment to Grandma, the four of us sat down to investigate Topo's potential abilities. He could learn to find his way around our house, carry messages and other items in his hands, and teach us Logo (and more about programming). We established some rules. Many were "don'ts," such as don't ask him to carry liquids, don't push him off the edge of the porch (James contributed that one), and don't try to program him unless Mom or Dad is there to help.

TURNING THE WHEELS OF PROGRESS

At the sound of his name, Dad snapped the lid down on the Apple's disk drive and announced that we were ready to begin the calibration process, that is, to make sure that Topo's two wheels turned at the same speed. It's more difficult than it sounds. Dan lifted Topo onto his Styrofoam perch to allow his wheels to turn freely, while we crawled around on the floor looking to see if Topo's "running lights,"

MEET TOPO'S RELATIVES

I met the new digital version of Topo recently, and when we were introduced, he greeted me with "Hi there, Betsy—want to hear me sing?" and proceeded to regale me with numerous choruses of "100 Bottles of Beer on the Wall"! I was charmed.

As well as voice capabilities, this new Topo also has the ability to move under his own power. When his human companion presses the front of the triangular red button on the top of his head, he says "Forward," and moves forward a short distance. The same technique, when applied to the left, right, or rear of his head, will cause Topo to turn or move in reverse.

Digital Topo is controlled with a wideband infrared controller, and although the robot I met is still programmed with the Apple II, II plus, or IIe, RS-232 compatibility with most microcomputers is promised by the second quarter of this year. Even though he carries a whopping price tag of $1,500, I hope my family will get to know him better in the near future.

I also gained a nodding acquaintance with Topo's smaller brother, F.R.E.D. (Friendly Robot Educational Device). At 12 inches tall, F.R.E.D. looks rather like a robot head on wheels. He has a vicelike appendage that can hold a pen or marker, and has his own key pad, making him accessible to non–computer owners and their children. He can be programmed from a computer using Logo, however, and is adorable as he scoots around tabletop or floor, drawing designs on huge pieces of paper.

F.R.E.D.'s wheels are constructed to make it impossible for him to fall off the table—this was the first thing I asked about, thinking of a certain pair of seven-year-olds. F.R.E.D. costs $395, and my guess is that he will become very popular with Logo users and teachers.

There are three more personal robots that intrigue me, even though we have not yet been formally introduced: Topo's long-awaited big brother, B.O.B., also from Androbot; RB5X, from RB Robot Corp. in Golden, Colorado; and HERO, from The Heath Kit/Zenith company in Benton Harbor, Michigan. HERO ($1,500 as a kit or $2,500 assembled) and RB5X (base unit $1,795—with arm, voice, or vacuum extra) are what I would describe as second- or even third-generation personal robots. HERO, like many robots currently available, was designed primarily as an educational tool. It was introduced in December of 1982 as an aid for teaching robotics.

These other robots have the ability to explore and interact with their environment through an amazing collection of sophisticated sensors. Their manufacturers claim that they are user-programmable to do almost anything the programmer can think up for them to do. There are also a number of canned programs designed for HERO and RB5X (and planned for B.O.B.) that allow the nonprogramming user to access them. Manufacturers seem to be encouraging programmers and hobbyists to develop programs and accessories for their creations.

RB Robot Corp. offers a "Robot Appreciation Kit" to educate the public about robots in general and RB5X in particular. The kit includes ideas on home applications for robots, a reference list, and an order form for books on robotics, reprints of nine articles about personal robots, and more. The kit can be ordered from RB Robot Corp., 18301 W. 10th Ave., Suite 310, Golden, Colorado 80401—or from any RB5X dealer.

For more information about Androbot, Inc.'s robots, write or call Nina Stern Public Relations, 2163 Vista Del Mar Ave., Hollywood, California 90068; (213) 462-3539. To find out more about HERO, contact Heath Kit/Zenith Educational Systems, Hilltop Rd., St. Joseph, Michigan 49085; (616) 982-3200.

which are located behind his wheels, were on, off, or flickering. The kids loved every minute of it! (An Androbot spokeswoman told me that the new version of Topo is self-calibrating, which I feel is a wise move.)

We later discovered he can be calibrated from Logo, as well as BASIC, but the procedure is essentially the same. Luckily, the program can be saved on disk when completed and never has to be done again.

Now that it was time to actually bring Topo to life, Dan was arguing for BASIC, while Timmy and I voted for Logo. BASIC won, with the promise that Logo would be Topo's primary language. The manual told us that Topo had subroutines for each direction. For example, to make him go forward 100 Topo steps (each step is a centimeter), we found the subroutine in the manual and typed:

```
LM=30:N=100
GOSUB 5100
LM=5:
```

What a reaction we got from the kids upon accomplishing this simple maneuver! "He's alive!" they shouted, and dashed to his side awaiting more computer magic. But the problem with using Topo in BASIC was that only Beth could read well enough to use it effectively. The kids were thrilled with the things Dan and I programmed Topo to do, but they wanted to do it themselves.

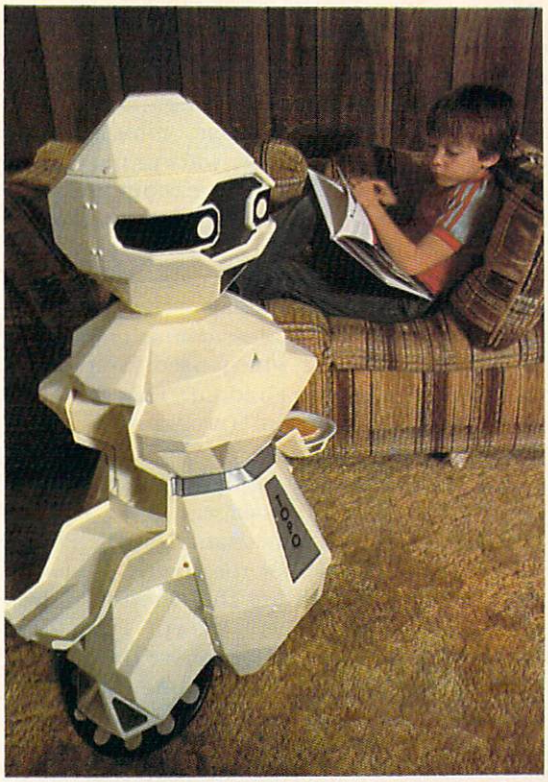
This they did, after a hurried dinner at which they insisted I set an extra plate for the robot. (The Set-an-Extra-Plate Syndrome seems to increase in direct proportion to the children's interaction with the robot and is substantially different from the way Molly relates to her Barbie doll.)

A DRAINED 'DROID

As a robot user, I sometimes feel our little android seems to have a life of his own, particularly when he is stubborn about carrying out our commands or gets "tired" and has to have his batteries recharged. This was exactly what Topo needed only a few minutes into our first Logo session with him—evidently calibration had been even more draining for the robot than for me!

The children were disappointed, but cheered up when I suggested reading a chapter from *The Star Wars Question & Answer Book About Computers* by Fred D'Ignazio (Random House). I found it to be an excellent starting point for discussions about robots and the infinite variety of ways they are (or soon will be) used in everyday life. Molly fell asleep while Dan was telling us about some of the new robots from General Electric that will do jobs too dangerous or too unpleasant for human workers.

At the end of that first evening, I was beginning to understand how someone who could afford it might justify the expense of a home robot—even one that can't do housework! Topo had been responsible for a warm and enjoyable family experience that evening,



the kind of sharing that seems to happen less frequently as the children grow older. Beth, who feels computers (along with almost everything else in the world) are boring, had chimed in with ideas when we were discussing our dream robot of the future—she wants hers, of course, to be able to answer the phone and take messages!

As Topo settled into our household, it wasn't long before he was the center of a wild and woolly afternoon, with myself, Timmy, James, and Molly as supporting characters. Timmy had spent some time learning Logo on our Commodore 64, so I bravely let him take command of the Apple keyboard for a Logo session with the robot. I had my doubts that James would stick with it—he loves computers, but has a shorter attention span than his brother, who has been known to rise at dawn to get in some computer time before school. Molly was enchanted to be able to do anything with Topo and announced that a robot was better than a kitten any day. Before Topo had been sent more than 50 TFDs (Topo Forward 50 centimeters), James was in control of the computer and Molly and Timmy were shouting commands to him from Topo's side. It went something like this:

Timmy: "Type TFD 30, JJ. OK, now TRT 90, then TFD 30 again—whaddya mean it didn't work?"

James: "Wait a minute—I forgot the space! There, the turtle's going—is Topo?"

Molly: "He's moving! Show me the turtle. . . . Look, it's making a map of our house!"

Timmy: "He's not straight, James—we gotta turn him now, but I don't know how much. Come and look and see what you think, I'm gonna try a LEFT 15—"

MY DREAM ROBOT . . . WOULD MOVE MAJESTICALLY THROUGH MY WORLD, SCOOPING UP DIRTY LAUNDRY.

CONSTRUCTIVE COOPERATION

I couldn't believe it. Getting those three to actually cooperate on anything had always been nearly impossible. Although each of the kids worked fairly well alone, computer sessions turned into computer wars at the drop of a hat. And here was James, the computer game kid, doing something constructive for more than five minutes.

Of course, some of the credit has to go to the Logo language itself. Logo was designed by Seymour Papert at the Massachusetts Institute of Technology and is widely used as an introductory language for children. This language allows a child to "train" (program) a wedge-shaped "turtle" to move around the screen, leaving a line behind it. By giving the turtle specific commands, a user can draw shapes. Topo is similar to the mechanical turtle Papert first used as a model for the screen version of Logo. He does everything that the turtle does on the monitor screen, except PEN UP, of course—he isn't able to float above the ground! [*For more information about the Logo language and Seymour Papert, see last month's* FAMILY COMPUTING.]

TOPO THE TEACHER

One of the most exciting experiences that Topo and I have shared occurred not at home, but at the McKinley Middle School Community Education Program, where I was teaching a computer class. Most of my students had never been exposed to computers and were very uncomfortable around anything high-tech. The class was in its third week, and things weren't going well. The students were still reticent about approaching the two class computers, even though I'd tried to entice them with my most interesting software. I hadn't even considered trying Logo, since I thought of it as a language designed for kids. But, I thought, how about using the robot? I decided to enlist Topo.

So, one evening I repacked Topo in his carton and headed for the school. My students, many of whom are retirees, were enchanted with the little robot. When the inevitable "But what can he do?" was asked, I briefly explained Logo commands and encouraged the students to design a procedure that would allow Topo to navigate a path to the classroom door, with me typing in the commands. They got into the spirit of robot training as eagerly as my kids had, and, before long, someone suggested we program Topo to put on a show for the other classes. I told them that I thought this was a wonderful idea, and that I would go and invite the other classes while they designed and programmed the "Topo Revue." I refused to listen to protestations of mechanical ineptitude. My class hesitantly approached the Apple as I rattled off last-minute instructions. I ran down the hall to issue the invitations. When I finally returned to my students, a different group greeted me—they were laughing, joking, and tapping on the computer keys as though they'd been doing it all their lives!

The performance they had assigned Topo was nothing short of amazing—he circled the classroom, did a nifty little dance, and rode neatly into his box, ready to go home. Mission accomplished.

No wonder Topo got along well with students. Elayne Haggan of Androbot, Inc. told me later that most Topos have been sold to schools, not to families. As an educational tool, Topo earns his pay—he's definitely NOT a toy. Rather, he motivates children and adults to learn about computers, robots, and the amazing Logo language.

THE FUTURE OF THE ROBOT

They tell me my dream robot may come to be in the not-too-distant future. It would not be too unrealistic to predict that by 1986—certainly by 1989—robots could become as popular in American homes as computers are in 1984.

In fact, talking robots that can play entertaining, interactive, educational games with your children, do guard duty, vacuum the living room rug, or fetch your favorite refreshment from the refrigerator are already available—but they are not inexpensive. [*See box on page 54.*]

Useful arms for these marvels are a fly in the ointment, however. Most of the "dream" robots have arms that are relatively weak and clumsy. There is a very good reason for this: Evidently any arm with a grip strong enough to lift more than a few ounces is also able to do injury to a human, particularly a small child. A robot designer from Androbot told me that the company will not incorporate gripping devices into their designs until sensors can be used that differentiate between, say, a child's hand and a can of soda pop.

Of course, all over America, there are electronic whizzes, both adults and kids, building personal robots of all shapes and sizes. Robots whose bodies are made from high-tech parts such as plastic garbage cans and terrariums sometimes out-perform expensive, commercial versions, but alas, are usually one-of-a-kind models.

Many computer users' groups and organizations now boast special interest robotics groups. Two of the better known ones are the Robotics special interest group of the prestigious Boston Computer Society and the Atlanta Computer Society's Robotics special interest group.

Commercial home robotics is an industry still struggling to create a market and waiting for technology to catch up with design. For some time to come, robots will be designed as educational devices—rather than the willing servants and companions we are familiar with in literature and on the stage and the silver screen. But our dream robots are coming, and they will be in our homes very soon. FC

ROBOT READING

Blade Runner (Do Androids Dream of Electric Sheep?), *by Philip K. Dick (Ballantine), paperback, $2.75.*

Build Your Own Working Robot, *by David L. Heiserman (TAB Books), paperback, $6.95.*

I, Robot, *by Isaac Asimov (Fawcett), paperback, $2.25.*

I Sing the Body Electric, *by Ray Bradbury (Bantam), paperback, $2.25.*

Mindstorms: Children, Computers, and Powerful Ideas, *by Seymour Papert (Basic Books), paperback, $6.95.*

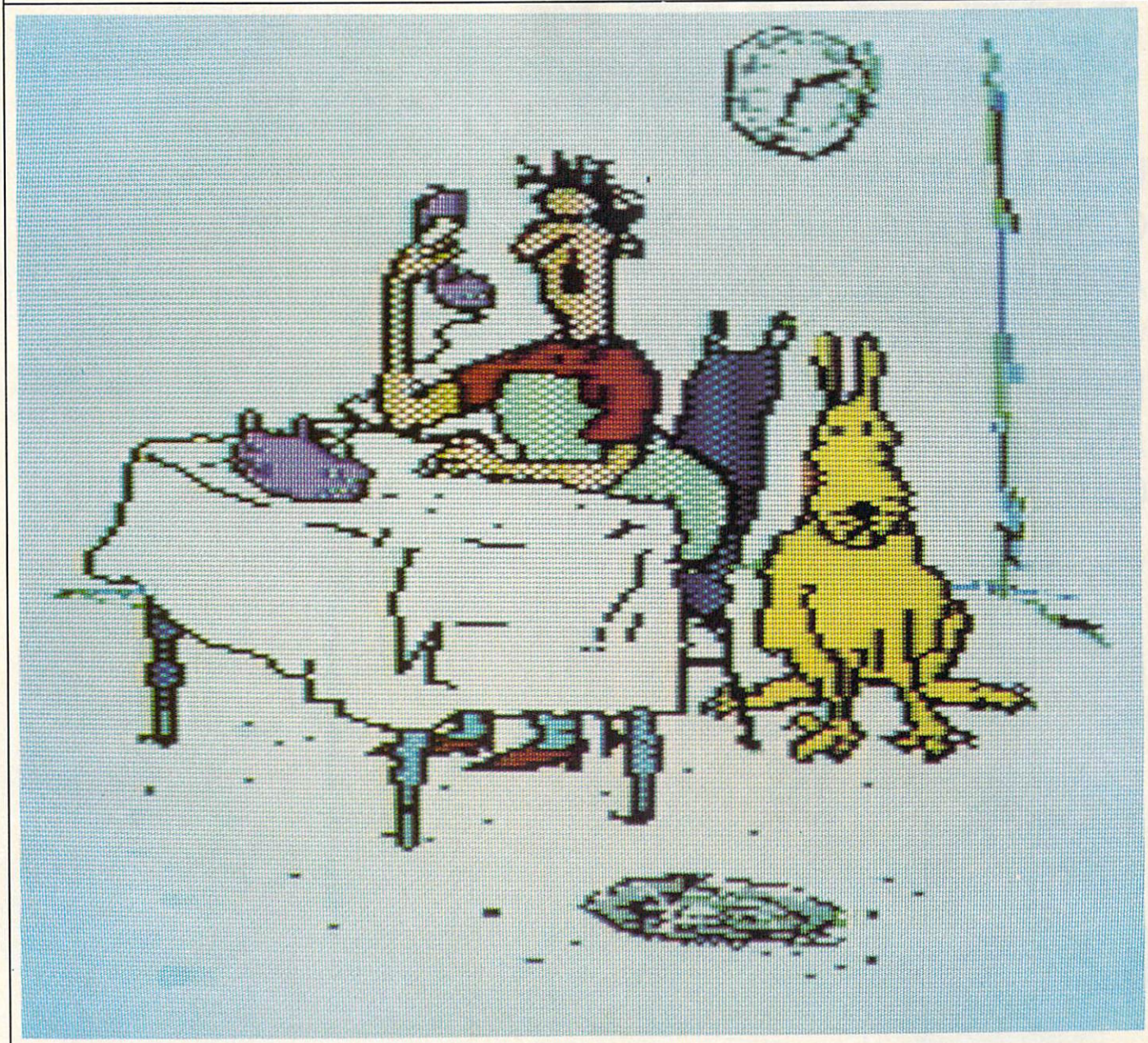
Projects in Machine Intelligence for Your Home Computer, *by David L. Heiserman (TAB Books), paperback, $6.95.*

Robots on Your Doorstep, *by Nels Winklessless and Iben Browning (Robotics Press), paperback, $9.95.*

Robots Robots Robots, *edited by Harry M. Geduld and Ronald Gottesman (New York Graphic Society), hardcover, $14.95.*

The Star Wars Question & Answer Book About Computers, *by Fred D'Ignazio (Random House), paperback, $4.95.*

TRON, *by Brian Daley (Ballantine), paperback, $2.75.*



"I took the video game player out of the hall, hooked the computer into the TV, put the whole works along with Fred in the den and tied most of the dogs in the back yard but, Esther, it's a temporary arrangement."

The World Is Your Oyster

USED TOGETHER, YOUR COMPUTER, A PHONE LINE, AND A MODEM CONNECT YOU WITH AN EXTRAORDINARY RANGE OF SERVICES, GAMES, AND INFORMATION. IT'S CALLED "TELECOMPUTING."

BY RICHARD W. SLATTA

One of the best things about owning a home computer is exploring the never-ending variety of ways to put it to use. For example, that little piece of plastic, silicon, and wire can connect you to a whole new world—telecomputing—for a minimal investment. "Great," you say. "So what's telecomputing and what can it do for me?"

You are telecomputing when you link your home computer to other computers via ordinary phone lines and a modem. The connection puts you in touch with a wide range of 1) entertaining games and features, 2) convenient services, and 3) useful information and research data bases. The entire family can enjoy, learn, and profit from telecomputing—and it need not be difficult or costly. We'll explain how to hook up your computer to a telecomputing network in a little while. But first, let's exam-

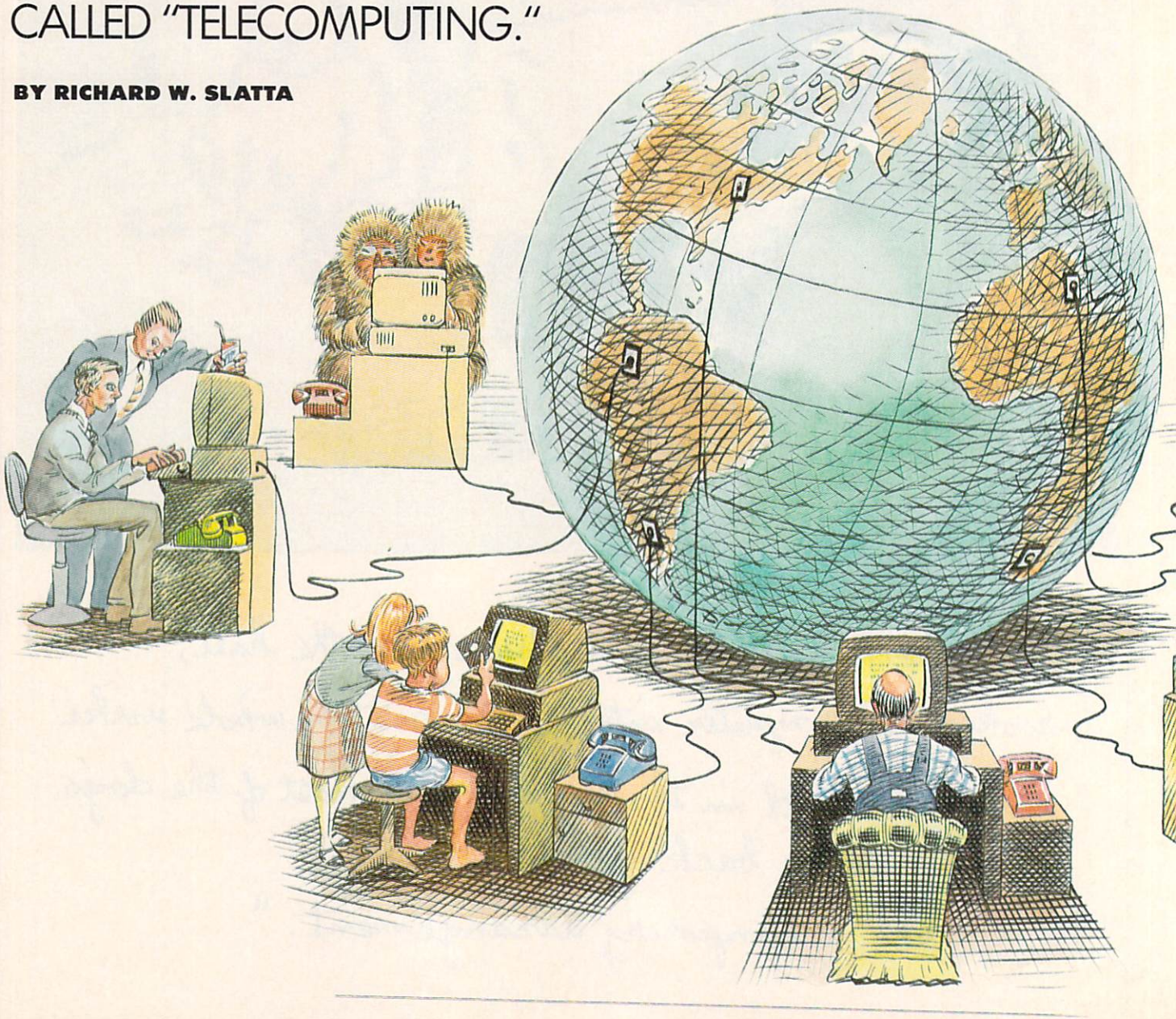


ILLUSTRATION BY GIL EISNER

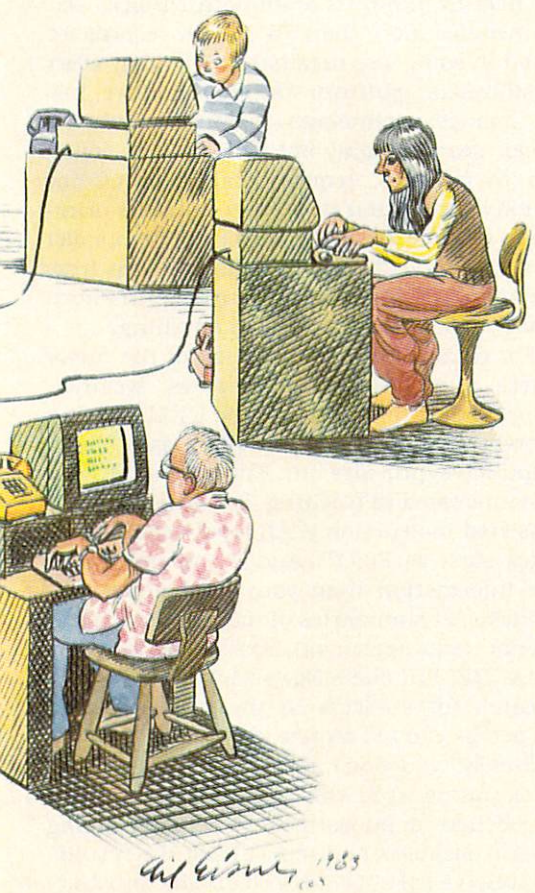
ine a few of the major telecomputing services of interest to the computing family. Among them: BRS/After Dark, CompuServe, DELPHI, DIALOG Information Services, Dow Jones News/Retrieval, and The Source. These services offer a variety of packages designed for growing numbers of home computerists.

ENTERTAINMENT

No matter how we rationalized the purchase of a home computer, deep down many of us knew we wanted to have fun. Admit it. I bought my machine for writing up historical research and for managing the masses of notes and bibliographies that a historian accumulates. But I also knew that computers were fun—and I wanted one. Access to games alone may be enough to bring you into the telecomputing fold. The DELPHI system began with 30 games, CompuServe has at least 45 (plus a Games SIG—Special Interest Group), and The Source has some 80. These challenging contests allow you to pit yourself against other players and against a wondrous pantheon of worthy opponents. From *Blackdragon* to *Star Trek*, you'll have games galore.

Games aren't for you? You're a movie buff? Dow Jones and other services include timely movie reviews. Maybe you're into CB radio? 10-4. Tie into CompuServe's CB Simulator, and you can rag with CBers across the nation.

How's that for CB power? Channel 1 is reserved for adults, Channel 17 for kids 17 and younger, and other channels for general or conference use.



SPECIAL INTEREST GROUPS

Whatever variety of interests your family enjoys, others around the nation probably share them. Many telecomputing services offer access to groups whose members share a common interest. On CompuServe there are 59 different SIGs that provide users with bulletin boards to post notices, allow access to data bases of files and programs, and permit conferencing so that members can chat with one another. Operating SIGs include users' groups for most popular computer brands.

CompuServe's Family Matters SIG offers helpful assistance in parenting and family topics, coordinated by Dr. Bob Lindamood, head of a family counseling service.

DELPHI's Infomania has an ever-changing number of groups. There are users' groups for Apple, Atari, and IBM; an author's group for writers; and Collaborative Novel, where subscribers can join forces to create a common work. Member's Choice is a wide-open category where users form a group for whatever interest they share.

The Source calls its almost 30 different special interest groups "Private Sector," which includes EDLINE, a network for educators, school systems, and others with an interest in the field.

Virtually no area of interest goes unrepresented on the telecomputing systems—and if it's absent you could start a group yourself.

FINANCE

Whether the economy is strong or weak, we all need financial and business assistance. The Dow Jones News/Retrieval system is specifically designed with business information in mind. It provides historical and current stock market quotes, corporate earnings estimates, and timely data on government and business activity. For home finances, many services provide programs for balancing your checkbook, investing in the money market, or paying bills. CompuServe's Home Banking and Liquid Green Trust provides all these services. And The Source offers programs for figuring depreciation schedules, loan amortizations, and even spreadsheet programs for extensive financial computations.

TRAVEL

Has airline deregulation left you confused about flight schedules and ticket prices? On several of the systems, you can consult the *Official Airline Guide, Electronic Edition* (*OAGEE*), and find your own best route and

NO MATTER WHAT YOUR RESEARCH PROBLEM, TELECOMPUTING CAN SAVE THE DAY—IN MUCH LESS THAN A DAY.

RICHARD W. SLATTA *is an assistant professor of history at North Carolina State University in Raleigh. He uses telecomputing services for academic research, to keep up with current events, and to make new friends.*

SOME POPULAR TELECOMPUTING SERVICES FOR FAMILY USE

BRS/After Dark
1200 Route 7, Latham, NY 12110; (800) 833-4707

COST: $50 initiation fee; $6 to $20 per hour on-line; $12 monthly minimum charge.

SERVICES: Ten data bases on science and medicine; four on business and finance; four on education; seven on social sciences and humanities; *Books in Print.*

BRS/After Dark, as the name indicates, is available to users in the evening and early morning hours, and all day on weekends.* The research data bases are most useful for student research and related educational topics, although an expansion of services along the lines of CompuServe and The Source is anticipated. Information is available from a number of sources, including: the National Library of Medicine, and the National Council on Family Relations.

CompuServe Consumer Information Service
P.O. Box 20212, Columbus, OH 43220; (800) 848-8199

COST: One-time fee of $40 (includes five hours of on-line time); $6 per hour on-line (nonprime-time rate, evenings and weekends); $12.50 per hour prime time. There is no minimum charge.

SERVICES: One of the largest general-user services, CompuServe has a little something for everyone in the family: business information, the *Official Airline Guide*, hundreds of data bases arranged under four categories: Personal Computing, Business and Financial, Home Services, and Services for Professionals. Users receive two publications: a monthly magazine named *Today*, on a trial-subscription basis, and a free monthly newsletter named *Update*.

DELPHI
General Videotex Corp., 3 Blackstone St., Cambridge, MA 02139; (800) 544-4005

COST: One-time fee of $50; $5 per hour evenings (6 p.m. to 8 a.m.); $24 per hour days.

SERVICES: As a relatively new general-user service, DELPHI lacks the large offerings of more established services, but is working to catch up. Offerings include UPI news, travel schedules, banking, shopping, games, mail, and others. Some of its offerings carry a surcharge; for example, Comp-U-Store, for computerized buying, costs an extra $25 a year.

DIALOG Information Services, Inc.
3460 Hillview Ave., Palo Alto, CA 94304; (800) 227-1927

A. DIALOG Information Retrieval Service

COST: No minimum or subscription fees, although a users' manual costs $40; $15–$300 per hour on-line; up to $100 free connection time during first month of service; additional fees for off-line printing.

SERVICES: This collection of more than 180 data bases, with more than 15 million records, is among the most comprehensive for serious, in-depth research on virtually any topic. Business and academic researchers will profit from the depth of the collections, but there are no games or other services.

B. Knowledge-Index

COST: No minimum; $35 initiation fee, which includes two hours free time; $24 per hour on-line; limited hours of access.

SERVICES: Includes more than a dozen of the most used data bases from the DIALOG listings, representing data from more than 10,000 journals. Topics include computers and electronics, engineering, government publications, magazines, medicine, news, and psychology. Adequate coverage for most home and school research needs.

Dow Jones News/Retrieval
P.O. Box 300, Princeton, NJ 08540; (800) 257-5114

COST: Various user levels are available, but the standard subscription includes a one-time fee of $75; nonprime-time hourly rates range from $9 to $54.

SERVICES: Heavily weighted toward the business user, with an emphasis on stock market and other business news. Data bases include current and historical Dow Jones averages, Weekly Economic Survey, and highlights from the *Wall Street Journal*. General services include movie reviews, Comp-U-Store, weather, news, and the *Academic American Encyclopedia*. Users receive a publication named *DowLine*.

The Source
Source Telecomputing Corp., 1616 Anderson Rd., McLean, VA 22102; (800) 336-3366

COST: $100 subscription fee; $10 monthly minimum; hourly rates vary from $7.75 to $20.75.

SERVICES: One of the largest general-audience systems, The Source offers users a smorgasbord of more than 800 data bases of fun and information: financial news, business and tax programs, CHAT (to communicate with other users on-line), lots of games, and much more. Users receive a subscription to the newsletter *SourceWorld*.

Many other more specialized telecomputing services exist, tailored for particular business and professional markets, with more on the way. At the moment, CompuServe and The Source offer the computing family the greatest range of services at the lowest price. —R.S.

**The hours that telecomputing services are available to users may be based on local time, Eastern Standard Time, or Central Time. Higher, prime-time rates usually refer to the daytime peak hours of about 8 a.m. to 6 p.m., depending on the system. Consult the telecomputing service you're interested in to find out when you can go on-line in your area, and what time zone the subscription rates correspond to.*

fare. DELPHI provides flight information, as does The Source. And the latter even adds restaurant guides for New York City, Washington, D.C., and other points in the U.S. and Canada. CompuServe gives OAGEE access (with a $21-per-hour surcharge), as well as other services for business and tourist travel information.

SHOPPING

Price-conscious shoppers will be attracted to the 50,000 items discounted at Comp-U-Store. Merchandise is listed in 10 categories, and prices include shipping to the address you specify. The shopper pays a surcharge, but the browser can roam the electronic aisles for free. Comp-U-Store is offered via DELPHI, CompuServe, The Source, and Dow Jones. [*For more information on Comp-U-Store, see "A No-Hassle Way to Shop?" in the December 1983 issue of* FAMILY COMPUTING.]

RESEARCH

Your sixth-grader has to write a report on krill fishing in the South Atlantic. Your boss wants to know the performance of 25 high-tech stocks over the past six years. A tornado touched down near your hometown, but you missed the damage reports on TV. No matter what your research problem, telecomputing can save the day—in much less than a day.

DIALOG Information Services, Inc. offers two major data-base collections with serious researchers in mind. Its mammoth DIALOG service includes more than 75 million records arranged in some 180 data bases. Virtually every area of human endeavor—science, culture, history, finance, technology—is represented. Users can search highly specialized data collections in minutes, request on-line or off-line citation listings, and even order full texts printed out off-line for mail delivery. The smaller Knowledge-Index offers four million items from more than 10,000 different journals. In short, anyone anywhere can research anything.

For smaller research jobs, all of the major services offer encyclopedias, news, weather, and up-to-date financial reports. DELPHI has a research library of more than 200 data bases. CompuServe provides an Educator's SIG for those interested in teaching, learning, computer-assisted instruction (CAI), and learning languages such as PILOT. And if you need a bit more information than your local newspaper provides, UPI summaries of national and international news appear on Dow Jones and The Source. DELPHI offers Newstrack, allowing you to search for subjects in the headlines and then access the full stories if desired.

Finally, you don't need to just take from telecomputing—you can give, too. Dow Jones has solicited its subscribers to test developing software packages and report back the results. CompuServe asks its subscribers to contribute short essays for its monthly newsletter in exchange for 10 hours of on-line time.

SIGs also seek input from members. Thus,

A TELESTUDY OF COMPUSERVE

Teachers and students seem to have favorite topics for social studies projects. One of the most popular is volcanoes. Local-history themes are a big hit, too. I can't recall how many times I've seen reports on the Hatfields and the McCoys—two famous feuding families of West Virginia (my home state) and Kentucky.

My son Davy, 11, tried something a little different—and won first prize in his school's social studies fair. He did a study of CompuServe, the popular information service. The two months he spent on the project was one of the most enriching periods of his life.

It started one night when I was at my computer keyboard writing messages on CompuServe's Good Earth Special Interest Group (SIG), which I administer. Davy crept into the den and asked for help with project ideas. Compulsively, I blurted out, "Why don't you do something on CompuServe?" It took half an hour to convince him that it would be considered a "real" project. I think one of the selling points was the fact that he could learn about something of which his teachers knew nothing. That gives any student a feeling of real power.

SETTING A PLAN

"The first big problem you're going to have is trying to explain what CompuServe really is," I told Davy. "And once you do that, you're going to have to explain the impact telecommunications will have on people." The major point I wanted to get across to him was stated succinctly in John Naisbitt's book *Megatrends*—we are not in the "computer age" but, rather, the "information age," where the computer is only a tool.

We decided his project would consist of a series of "demonstration reports," focusing on the three main functions of CompuServe—message leaving and retrieval, on-line conferencing, and data bases. But there had to be more to make it work; Davy had to somehow involve the people who use CompuServe. To do that, he had to use CompuServe himself.

"Let's go fishing in some on-line SIGs," I suggested, "and see if people will help you." I told Davy to write a note asking for help and leave it on several SIG bulletin boards. Here's the message he wrote:

"I'M DAVID PEYTON, JR., 11 YEARS OLD, A SIXTH-GRADER FROM HUNTINGTON, WEST VIRGINIA. I'M IN DESPERATE NEED OF HELP! IT'S THAT TIME OF YEAR AGAIN TO HAVE OUR

Davy Peyton (foreground) with his parents and his prize-winning social studies project.

ANNUAL SOCIAL STUDIES FAIR AND I NEED YOUR SUPPORT. I'M WRITING A REPORT ABOUT COMPUSERVE AND I NEED YOUR ANSWERS TO THESE QUESTIONS. WHAT DO YOU LIKE BEST ABOUT COMPUSERVE? WHAT DO YOU THINK COMPUSERVE WILL BE LIKE IN THE FUTURE? WRITE RESPONSE ON THIS SIG'S MESSAGE BOARD!"

I showed Davy how to post it on the message boards for the Software and Authors' SIG and the Educators' SIG. Since he was already familiar with the Good Earth SIG, where I generally hang out, I wanted him to become familiar with some others.

ELECTRONIC MAIL ROLLS IN

The messages, left in my "electronic mail box," were better than either of us expected. And they struck at the very heart of what I wanted Davy to learn—communication via computers is changing the way people interact. As each response came in, Davy saved it to disk.

One response to my son's plea for help turned into an on-line conference. It was from Pat Goltz, wife of John Goltz who helped in the founding of CompuServe in 1969. She offered to be interviewed from her home in Arizona.

So, Davy set up a time for an interview and decided to use a conference channel in the Good Earth SIG. I sat with him throughout the interview, but let him ask the questions and save the interview to disk. In about an hour, he had explored the early history of CompuServe in an extremely professional manner. What's more, Davy was using the very system he was documenting to get the information!

Next, Davy went on-line for a conference, during which a CompuServe employee discussed the past, present, and future of the company. The employee fielded questions from 12 participants, sharing his thoughts about where CompuServe was heading.

Davy was quite eager for a demonstration of CompuServe's CB simulation, a free wheeling series of open channels where people from all over the U.S. gather for small talk, as well as serious talk. So, he went on-line for an hour or so of fantasy. Davy became ODIE, the character from the "Garfield" comic strip, and talked to people with "handles" such as MICKEY MOUSE, MINNIE MOUSE, GARFIELD, and OBI-MAN.

RESEARCH ON TSETSE FLIES

To demonstrate the type of data available for research, Davy retrieved and saved to disk the *World Book Encyclopedia* entry on the tsetse fly. I also taught him how to access the Associated Press wire and the National Weather Service data base.

By that time, we were ready to make the display for the fair. The rules said I could help Davy with the technical aspects of the display. And I did. Parents, in fact, were encouraged to help their kids make posters and construct "sets."

We spent a lot of time discussing the project around the dinner table. I urged Davy to think about the messages he had received. I asked him to go back and read them to determine the most important points. Finally, Davy took all the information he had stored on a disk and printed it out. Each example was given a title page, labeled as follows: Questions and Answers, Interview with Pat Goltz, Data, CB Simulation, On-line Conference.

We felt that the title of a CompuServe brochure, "Welcome to Someday," summed up the project, so we used it on the center panel of the display. On the side panels, we pasted printouts of messages, conferences, and data.

A WIN, THEN A LOSS

Davy easily won first prize in his school fair and was accepted for the county competition. He lost at that level. One reason he lost out was predictable. The other wasn't.

One judge, who thought Davy's project was one of the best, admitted that he didn't completely understand the idea of CompuServe. That was the predictable problem.

However, the fact that all the reports were typed must have made the judges suspicious. Although Davy had explained how he had saved the messages and data-base information and then printed them out, apparently some judges believed that anything that looked that clean couldn't have been hand-typed by a kid. But it was. Kind of.

—DAVE PEYTON

PHOTOGRAPH BY LEE BERNARD

telecomputing offers a new world of fun, convenience, and information—and it lets you reach out to the world with your own ideas as well.

LOGGING ON TO INFORMATION SERVICES IS USUALLY A BREEZE.

HOW TO CONNECT

So you've decided to tie your family computer into a telecomputing network. Wait. You spent time checking various computers before buying—take a little more time to ponder and research your telecomputing needs. First, what do you need?

1) A modem (*For information on what equipment is available, see the Buyers' Guide, page 63];*

2) In some cases, a cable to connect the modem to your computer;

3) Software (which may or may not come with the modem—be sure to check before buying);

4) A phone line to connect to the modem (an acoustic modem fits over a standard telephone handset; a direct-connect unit requires a standard modular phone jack);

5) A subscription to one of the telecomputing services.

TELECOMPUTING TERMS

Auto-answer: A modem feature that permits the unit to answer incoming calls automatically.

Auto-dial: A modem feature that permits the unit to automatically dial phone numbers stored in memory.

Auto-redial: A modem feature for redialing a number until contact is established.

Baud rate: The speed at which data can be transmitted over phone lines. The most common rate for modems, 300 baud (300 bits per second), provides for about 250 words per minute; 1,200-baud transmission is also possible, but modems with this capability are expensive.

Buffer: A device for temporary data storage. For example, data coming in through a modem might be stored temporarily in a buffer, then saved to disk when the buffer is full.

Download: To transfer data from a remote system to your computer (opposite of upload).

Full-duplex: The capability of a modem to both transmit and receive at the same time.

Half-duplex: The capability of a modem to transmit in only one direction at a time (like a CB radio).

Handshaking: The ability of two systems to signal readiness to carry out functions (e.g., A: READY? B: YES A: TRANSMIT DATA).

Junk: Also "garbage"—you'll know it when you see it. If proper communication is not established with a remote system, random, meaningless characters (junk) may appear on the screen.

Menu: A listing—as in a restaurant menu—of the kinds of information available for a telecomputing service (usually displayed on a TV screen or monitor).

Modem: Short for *modulator/demodulator:* a device to permit a computer to communicate with other computers or remote systems. There are two basic types of modems: acoustic and direct-connect.

1) Modem, acoustic: A modem with rubber cups that fit over a phone handset to establish communications. Also called "acoustic coupler."

2) Modem, direct-connect: A modem that plugs directly into the phone line with a standard modular plug.

Off-line: When your computer is not connected or logged on to an outside computer. It is often cheaper to have data printed out off-line and mailed, as opposed to paying high on-line rates.

On-line: Being connected via modem to another computer. Charges are usually based on the amount of time spent connected.

Originate/answer: A modem that can both originate and answer messages. Most telecomputing services are in answer mode, so to use them you must be in originate mode.

Port: A plug connection on a computer for attaching a modem or other device.

Protocol: A set of "rules" or conventions to permit two computers to communicate.

Public-domain software: Free programs available from telecomputing services or bulletin boards.

Upload: To transmit data from your home computer to another computer via a modem connection.

Determine which computer activities are most important to you and choose one or more telecomputing services that provide them. Write or call those services to find out if there are any special requirements for connecting.

Also, be sure to find out which modems meet the technical requirements of the service you're considering. To connect to The Source, for example, requires that you use a modem with full-duplex capability, so that it can transmit and receive at the same time. (*For definitions of telecomputing terms, see accompanying glossary.*)

HOW TO LOG-ON

Once you've decided what system you want, follow hook-up instructions carefully and you're ready to log-on to the rest of the world. On-line time to The Source, CompuServe, and other vendors costs money. Before logging on, try to find a free bulletin board. Most metropolitan areas have several. Find them by checking with local users' groups, computer stores, and computer-related publications. Get accustomed to your modem, the software commands, and the telecomputing experience by trying to communicate with such free services. Once you're comfortable and trained, you can confidently log-on to the telecomputing service you're paying for and proceed without wasting time and money. Most systems are very helpful—pay particular attention to on-screen commands that provide help for the user. Above all, do not be intimidated or embarrassed. The system will not laugh at you or condemn your mistakes. And you can't hurt the system—or your computer—by making mistakes.

Logging on to information services is usually a breeze. To connect to most systems, you follow these simple steps:

1) A local phone call connects the modem (and thus your computer) to a Tymnet or Telenet phone system.

2) The phone system connects you to the telecomputing service.

3) After you give a connection code and an ID number, you are prompted for your password (change it every few weeks for security's sake).

4) A welcoming message will let you know you are now signed on to the system.

5) Menus follow—be sure that you've read the documentation on commands and services so that you know what you want to do (and how to do it) before logging on.

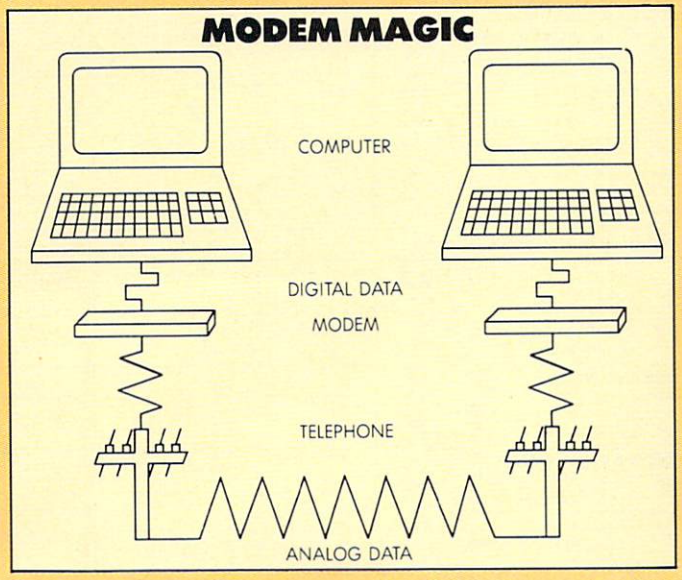
If you would like more detailed information, see the 325-page goldmine of information by Alfred Glossbrenner, *The Complete Handbook of Personal Computer Communications: Everything You Need to Go Online with the World* (St. Martin's Press, New York, 1983, $14.95 in paperback).

Well, that's it. Enjoy your dialogue with new friends and families around the country. What are you waiting for? FC

BUYERS' GUIDE TO MODEMS

DIRECT-CONNECT/ACOUSTIC COUPLERS/ A LISTING OF POPULAR MODEMS/ A PRIMER ON TELECOMMUNICATIONS SOFTWARE

Since human life began, people have been communicating over long distances by various means—rapping hollow logs, sending smoke signals, beating tom-toms, launching carrier pigeons, tapping the telegraph, and dialing the telephone. Communication via computers, which makes full use of telephone technology, ushers us into a new era.



A modem converts the computer's digital data into analog data that can be transmitted over phone lines; another modem converts it back to digital data so the receiving computer can read it.

In order to tap into this new and vast communications network—which can include big mainframe computers, information services such as CompuServe and The Source, your grandmother's micro, and even the newly formed MCI Mail—you need more than just a computer. You need a link between your computer and the phone lines. This go-between is a device called a **modem.** The term is an acronym for MOdulator-DEModulator, which describes the device's main function.

A modem translates the computer language into tones that can be understood and transmitted by telephone company equipment. Conversely, when information is received on the other end, another modem translates it again so that the receiving computer can understand it (see diagram).

Once the modem is connected to your computer and the phone lines (the methods for doing so vary), you need some software to get started. This is usually called **communications software,** or terminal software. It is needed to dial numbers, "chat" with other computers, send or receive information, and save it when you get it. (Not all software will allow you to do all these things.) Your modem, no matter how sophisticated, will be only as good as the software that runs it.

As with TV, you don't have to be an engineer to enjoy the benefits of a modem. The biggest problem is knowing what to buy. At last count there were more than 100 modems on the market, ranging in price from $49 to well over $1,000! And before you set out, you should tabulate the cost of a connecting cable, a serial card, and software package as well as the modem. It can add up, so don't try to fool yourself.

DIFFERENT TYPES OF MODEMS

Direct-connect. There are two types of modems: direct-connect modems and acoustic couplers. The direct-connect modem, which is becoming the predominant type, uses the same modular plug as your telephone. You merely disconnect the plug from your telephone and connect it to the modem. If you wish to keep your telephone connected, you can use a "Y-shape" adapter, with one end for the phone and one for the modem (Radio Shack sells a dual-jack extension cord, #279-373, for $6.95). However, you cannot use both the modem and your telephone at the same time.

Internal modem. For an Apple or IBM microcomputer, you can buy an internal direct-connect modem. (Some computers, like the TRS-80 Model 100, come with a built-in modem.) This is a plug-in card, or circuit board, that fits inside the computer. The main advantage of such modems is that they are neat (invisible, in fact) and don't require a cable for hookup.

Acoustic coupler. The acoustic coupler consists of a base, with two cups, that securely holds a telephone handset. Through the handset's transmitter and receiver, information is transmitted to and from your computer.

This type of modem was popular before the cost of the direct-connect variety was reduced, as a result of mass production and advances in technology. Basically, acoustic couplers are not as reliable as direct-connect modems. They can pick up ambient "room noise," which affects incoming signals. Interference can also be caused by the carbon granules in the telephone handset. And, they don't work with Princess or Trim-line phones.

FEATURES TO LOOK FOR

Originate/answer. When you start a communication with another computer, one computer must originate the call (and be in originate mode) and the other must answer (in the answer mode). Both computers cannot be in the same mode. Most modems can operate in both modes, but some can only originate calls. This would allow you to call an information service (such as CompuServe), a bulletin board, or another computer and send or receive a file; but without the ability to answer calls, no other computer would be able to reach yours. Many modems will automatically switch into the answer or originate mode, depending on the software used. But in some cases you change the setting manually, by flicking a switch on the modem.

Auto-dial/auto-redial. The ability to auto-dial means that you can dial numbers from the keyboard. And, depending on your software, you can store a phone number in memory and dial it with a simple command (such as "D"). Without the auto-dial feature, you manually dial numbers on the telephone; when a connection is made, you transfer the modular plug from the phone to your modem. Auto-redial means that the modem can be made

ILLUSTRATION BY VICTOR KOTOWITZ

to redial a number automatically if it is busy. (There is software available that will make some nonautomatic modems redial for you.)

The ability to dial or redial automatically is becoming more important as bulletin boards gain in popularity. Bulletin boards, commonly set up in someone's house or in a computer store, are computer systems you can dial to read or leave messages on specific topics. Because they generally have only one phone line and many users, it is not uncommon now to attempt connection with a bulletin board for 45 minutes or more!

Auto-answer. As its name suggests, the auto-answer feature allows a modem to answer a call in your absence. This feature is important if you are going to operate a BBS (Bulletin Board System) or have a business where it is necessary for outsiders to call into your computer system.

Anchor Automation's Volksmodem isn't fancy, but it does the job, and the price is right.

Baud rate. The speed at which a modem receives and transmits information is another factor in considering a particular model. A faster transmission will save you time and money, because you are charged at regular telephone rates for use of the lines. If the majority of your use will be within a local calling area (eight cents per minute), speed may not be important. If the telephone charges begin to increase to 20 cents per minute or more, you will appreciate a faster modem. Beyond this, you pay an hourly rate for using information services; the faster your modem, the smaller the bill.

The speed at which a modem transmits and/or receives information is measured in bits per second and is called its baud rate. The most widely used speeds are 300 and 1,200 baud. Three hundred baud is roughly twice as fast as human speech and transmits about 300 words (a little more than a typewritten page) per minute. A 1,200-baud modem is four times faster than its slower cousin (and significantly more expensive), and more dealers are starting to stock modems with this capability. It appears that the 1,200-baud modem will become the standard within two years.

Full- or half-duplex. To communicate, people must be able to speak and listen at the same time. This is true of many (though not all) computer communications as well. For instance, if you are receiving information you don't want from a host computer, you should be able to tell it to stop sending. This ability to send and receive at the same time is called full-duplex. By contrast, a half-duplex modem can both send and receive, but can only do one at a time. CB radios, for instance, use half-duplex transmission.

In the full-duplex mode, whatever you send to another computer is immediately "echoed" back to you. Thus, you can see on your screen exactly what you're sending, and make adjustments if the transmission is not clean.

Most, but not all, full-duplex modems can also operate in the half-duplex mode. Some modems support half-duplex transmission only. It's nice to have the choice, be-

POPULAR MODEMS

MANUFACTURER Model	COMPUTER	DC	BAUD	DUPLEX	FEATURES	PRICE
ANCHOR AUTOMATION						
Volksmodem	ALL	Y	300	F/H	O/A	79
Mark VII	ALL	Y	300	F/H	O/A	159
Mark XII	ALL	Y	300/1200	F/H	AD/A/S	139
ATARI INC						
Atari 1030	Atari	Y	300	F/H	AD/A/S	139
COMMODORE INC.						
1600	C 64 VIC-20	Y	300	F/H	AA/AD/S	85
1650	C 64	Y	300	F/H	AA/AD/S	125
HAYES MICROCOMPUTER PRODUCTS INC.						
Smartmodem 300	ALL	Y	300	F/H	AA/AD/ R	289
Smartmodem 1200	ALL	Y	300/ 1200	F/H	AA/AD/ R	699
Smartmodem 1200B	IBM PC	Y	300/ 1200	F/H	AA/AD/ R/S	599
Micro-modem IIe	APPLE	Y	300	F/H	AA/AD/ R/S	329
MICROPERIPHERAL CORP.						
Micro-connection	ATARI	Y	300	F/H	O/A/S	150
Micro-connection	C 64 VIC-20	Y	300	F/H	O/A/S	150
MURA CORP.						
MURA 300DC	ALL	Y	300	F	O/A	85
NOVATION CORP.						
103 Smart-Cat	ALL	Y	300	F	AA/AD	249
103/212 Smart-Cat	ALL	Y	300/ 1200	F	AA/AD	595
Apple-Cat II	APPLE		300/ 1200	F/H H	AA/AD/T/ S	389
J-Cat	ALL	Y	300	F	AA/O	149
D-Cat	ALL	Y	300	F	O/A	199
PROMETHEUS PRODUCTS						
ProModem 1200	ALL	Y	300/ 1200	F/H	AA/AD/ /M/D/S	495
RACAL VADIC CORP.						
VA212LC	ALL	Y	300/ 1200	F	AA/O O	495
VA212PA	ALL	Y	300/ 1200	F	A/AD/M	695
TANDY CORP.						
AC-3	TRS80	N	300	F	A/O	149
Modem I	TRS80	Y	300	F	A/O	100
Modem II	TRS80	Y	300	F/H	AA/AD	200
U.S. ROBOTICS INC.						
Autodial 212A	ALL	Y	300/ 1200	F/H	AA/AD/S	599
Password	ALL	Y	300/ 1200	F/H	AA/AD	449
Password 300	ALL	Y	300	F/H	AA/AD	189
Phone Link	ALL	Y	300	F/H	O/A	189

Key to Chart:
DC: Direct Connect
BAUD Code: all modems are 103/202/or 212A
DUPLEX Code: F = Full; H = Half
FEATURES Code: AA = Auto-answer, AD = Auto-dial, O = Originate, A = Answer, S = Software, M = Memory, R = Auto-Redial

cause you can experiment in different situations to see which mode gives you the best transmission.

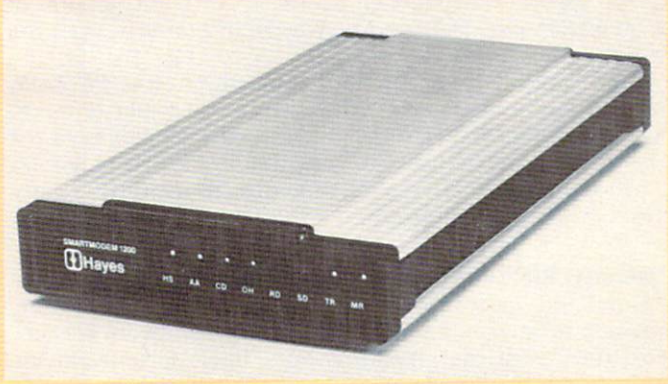
Tone/pulse. Some modems can dial out only through pulse, or rotary, phone systems. Others can be dialed through both pulse and touch-tone systems. Unless you are sure to be using only a rotary phone, it's worth finding a modem that can work with both types.

Cables. Except with internal modems, which fit inside your computer, you will need a cable to connect the modem to your computer. (For the Atari 400 and 800 models, you also need the Atari 850 interface.) In some cases, the necessary cable connector comes with the modem. If so, make sure the cable is designed to fit your computer.

It is more likely that you will have to purchase the cable separately, or even have a cable specially made. Modems connect to the serial port of computers and basically adhere to the RS-232C standard for serial devices. However, since computers have different types of serial ports, no one connector will fit all types. Second, since most serial ports are designed for printers (and not modems), the same RS-232C cable will usually not work with both devices. Certain lines, or pins, within the cable have to be switched to work with modems. Most cable shops will make the necessary adjustments for $20 or $30—as long as they are given the proper specifications. You can often get these from the documentation for the communications software package you use.

Finally, for Apple, TI, IBM, and TRS-80 computers, which do not always come with a built-in serial port, you will have to purchase a serial card (around $200). Then you have to get a cable made that will fit the serial card you choose.

Properly connecting your modem to a computer is perhaps the most difficult and confusing part of the telecomputing process. Just stick with it, take nothing for granted, and try to see how a modem, cable, software package, and computer work together before you buy. This goal, while not always achievable, is one worth striving for.



The Hayes' Smartmodem 300, with a built-in microprocessor, has become a standard for "intelligence" and quality.

THE HAYES MODEM ET AL

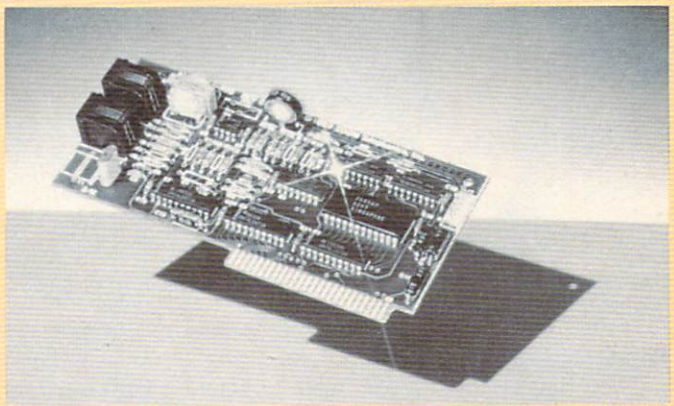
The most popular line of modems on the market today is made by Hayes Microcomputer Products. Ask any three computer stores in your area what kind of modems they carry, and—you guessed it—they all carry the Hayes line. The reasons are simple: They work with most computers, and a lot of communications software is written for them. They are very sophisticated—as one of the brand names, Smartmodem, implies—with a built-in microprocessor. And they are reliable. A dealer knows that once he has sold you a Hayes modem, he won't see you again until you are ready to buy something else. Hayes offers excellent support and a two-year product warranty.

While Hayes was the first modem company to establish a strong brand name, there are other brands that have a reputation for working well. Many of these offer most, if not all, of the features that the Hayes line offers. Check the accompanying chart to see which modems work with your computer model and offer the features you want at a price you can afford.

Novation, Inc. manufactures the Apple Cat II, a very successful internal modem for Apple computers: *ComWare II* software is included. Their pint-sized J-Cat is one of the smallest modems around and makes a nice companion for portable computers.

IBM PC owners should take a good look at ACCESS 1-2-3. This combination of a 1,200-baud plug-in modem (PC1200B) and *Crosstalk* (Microstuf, Inc.) software is one of the most impressive packages in the industry.

U.S. Robotics offers a full line of modems, from the moderately priced Phone Link ($189) to the 1,200-baud Autodial 212A, which comes with software. Their latest model, Password, is a palm-sized modem, slightly bigger than Novation's J-Cat, and it offers 1,200-baud capability. The users' guide for Password is extremely simple—what a refreshing change to find plain language to explain a complex process. Furthermore, U.S. Robotics backs its modems with a two-year warranty.



The Hayes 1200B modem is an internal modem for the IBM PC. It's a modem and a serial card rolled into one.

INTELLIGENT PERIPHERALS

Another new and promising product is the ProModem 1200, from Prometheus. This 300/1,200-baud auto-dial modem has a built-in chronograph, which shows the time of day you log on to another system and the length of time you remain connected. It can also automatically receive and save files, even when the computer is turned off! This sophisticated feature is part of a new trend in the computer industry, with many peripherals designed to be as "intelligent" as the computers themselves. Software is being developed to take advantage of the ProModem's intelligent capabilities.

Microperipheral's Microconnection modems, for the Atari and Commodore computers, have a parallel printer port built in. This is a nice feature, because neither the Atari nor the Commodore computer comes with a parallel port. These inexpensive modems ($150) come with the proper cables for both computers, and include a small communications program to get you started. You type in and save the program. This, too, is a nice feature, as it will allow you to connect with bulletin boards and perhaps "download" a more sophisticated communications program.

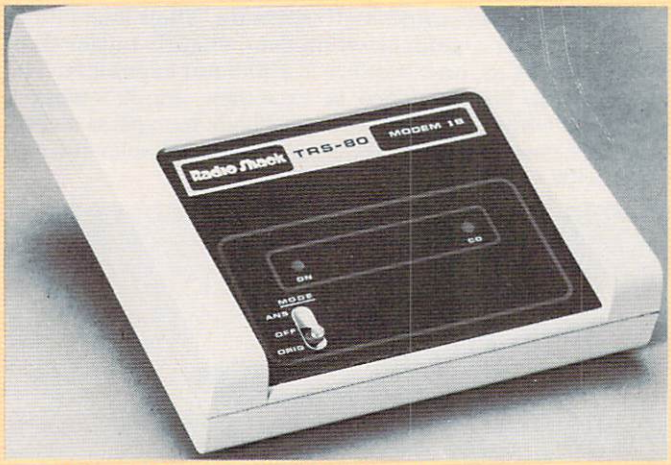
COMPUTER MAKERS' MODEMS

Commodore offers the 1600 and 1650 modems for the VIC-20 and Commodore 64 computers, respectively. These modems are well spoken of by their users. Their low cost and the software they come with (*Term 20* or *Term 64*) make them an attractive buy.

Radio Shack supports its TRS-80 line of computers with

four modems. There is even an acoustic coupler, the AC3, which can both originate and answer phone calls, somewhat of a rarity. On these, as on most of its products, Radio Shack offers good documentation, reliable service, and good overall product support.

Apple is now (or soon will be) selling its Apple modem in two models—a 300- and a 1,200-baud type. (See item in "New Hardware Announcements.") Texas Instruments' Telephone Coupler, an acoustic coupler, can be used with a speech synthesizer to convert text to speech, a nice feature for deaf users. Finally, Timex Sinclair is marketing its 2050 modem for use with the TS 1500 and TS 2068 computers. If you cannot find it in the stores, call (800) 24-TIMEX to place a direct order.



One of Radio Shack's TRS-80 modems has a manual answer/originate switch.

COMPATIBILITY

If you have Modem X and wish to connect with a friend who has Modem Y, you should be able to do so with little problem. You don't have to have the same modems or use the same software to communicate—though you will probably have to experiment a little before figuring out the best method and modem settings to use. However, both modems must conform to certain standards. The most popular standard is the Bell 103, used for 300-baud communication, and Bell 212A, for 1,200-baud communication. Standards other than these should be avoided, as you might not find too many other users to connect with.

If the settings and standards on two modems match, they can be the "great equalizer." Different computers and different people around the world can then communicate.

U.S. Robotics' Phone Link is an example of an acoustic coupler. Once you dial and make a connection, you place the phone receiver onto the "cups."

COMMUNICATIONS SOFTWARE: THREE WAYS TO GET IT

ONE OF THE VERY BEST PROGRAMS AROUND IS ABSOLUTELY FREE!

You need software to fully utilize a modem. Without it you cannot make connections with outside computers, send, receive, store, or print out data. There are three ways to get communications software: through users' groups, with the modem itself, or independently. It so happens that one of the best communications software packages around is free!

It's called *MODEM* (or *XMODEM*, *MODEM 7*, etc., depending on the version and the computer it's written for) and was developed in the late 1970s. It is extremely simple and efficient, allowing virtually 100 percent error-free transmission of files from one computer to another. *MODEM* is in the public domain, and can be used and legally copied at no charge. You can usually find a copy of it through local users' groups.

MODEM has been improved and refined over the years, but its core remains unchanged. Many commercial programs that work well have incorporated what has become known as the "Christensen protocol," or some version of it. (*MODEM* was developed by Ward Christensen, with the help of Randy Suess.)

Another good program that's virtually free is *PC-Talk*, for the IBM PC. This program is not in the public domain, but considered "freeware." That is, the developers hold the copyright but allow users to copy the program and ask for a $35 donation if they plan to continue using it. Again, check an IBM users' group.

"BUNDLED" PACKAGES

More and more modem manufacturers are including software in "package deals." Much of this software is excellent; at the very least, it allows you to hook up your modem and use it immediately, without another shopping expedition. These deals are worth looking for. If you don't like the software, you can always upgrade later.

The best example of a bundled package is ACCESS 1-2-3 (Novation) for the IBM PC. This PC1200B modem and *Crosstalk XVI* software combo is superb, and gets raves from users. Novation also sells its popular Apple Cat II with software.

Hayes markets three bundled packages: Micromodem II (no longer manufactured but still available in some stores) and Micromodem IIe (for the Apple II plus and IIe) come with the *Hayes Terminal Program*, and *Smartcom I*, respectively. The Hayes 1200B modem comes with *Smartcom II*. Both packages are easy to use and powerful, and have been widely accepted in both home and business environments.

Commodore is now shipping its Automodem 1600 and 1650 with *Term 64* and *Term 20*, for the Commodore 64 and VIC-20, respectively. Both programs come on one cas-

sette and can be transferred to a disk. While they do not allow you to save incoming data to disk, these programs have been well received by users.

Atari, Inc. says it is now sending off its new Atari 1030 modem, which comes with built-in *ModemLink* software. The 1030 modem is also compatible with Atari's *TeleLink* software, which comes on a cartridge. Neither the *ModemLink* nor *TeleLink* software allows you to receive and save files.

MORE NOTEWORTHY PROGRAMS

There is, of course, a landslide of third-party software as developers try to cash in on the telecomputing boom. Much of it does nothing that the free *MODEM* program doesn't do, but there are some noteworthy gems.

When shopping for communications software, you should look for two main things. First, the program should be easy to use. This is true of all software, but since telecommunicating can be complex, it is even more important. Do you need a Ph.D. from Harvard to figure the program out? Let a dealer run you through the program to check. Make sure the documentation has a good index, so that you can find information in a hurry while you're online. A good program will let you jump around from menu to menu, from command to command, quickly and easily.

Second, the program should have a good error-checking routine. The best is the above-mentioned Christensen protocol. Also check for XON and XOFF codes. These tell the sending computer to start sending data and to stop when the buffer is full. When data has been saved and the buffer is empty, XON will restart the process.

Some programs allow you to save files, a nice feature. Others provide "macros," where you can store phone numbers and modem settings for people you call often. And some programs have a built-in mechanism that allows you to automatically log-on to information services. One of the better programs around, *Modem 80* (The Alternate Source), for TRS-80 Models I, III, and 4 (in Model III mode), works well, is very flexible, and costs no more than a game—$39.95.

The best communications program for the Atari is *Teletalk* (Datasoft, $49). The new version of this disk-based program allows users to "download" programs from bulletin boards, may incorporate the Christensen protocol, according to sources. A Commodore version is also in the works.

The program many refer to as "the best" is *ASCII Express, The Professional* (for Apple II/II plus/IIe/III w/ emulator). This program is high-powered, designed primarily for professional use, but is finding its way into more and more homes. Southwestern Data Systems, the publisher, also markets *Z-Term The Professional* and *P-Term The Professional* (both for the Apple). These programs are for more specialized needs, such as handling CP/M or Pascal code. FC

DESIRABLE FEATURES IN A MODEM

1. Direct-connect
2. 300 baud (minimum)
3. Full- and half-duplex
4. Originate/answer
5. Auto-dial/Auto-answer
6. Bell 103 standard (for 300 baud); Bell 212A standard (for 1,200 baud)
7. Software included
8. FCC approved

30 LEADING COMMUNICATIONS PROGRAMS

PROGRAM (COMPANY)	COMPUTER	AUTO-DIAL	MACROS	ERROR CHECKING	MAX. BAUD RATE	$
ACE MAIL	TRS 80 I/III	Y	N	Y	1200	119
ACE MAIL	IBM PC	Y	N	Y	1200	139
ACE MAIL	TRS 80 I/III	Y	N	Y	300	79
ACE MAIL (Ace Computer)	IBM PC	Y	N	N	300	99
APPLE-LINK (Computer Applications)	APPLE II	N	N	Y	300	59
ASCII EXPRESS II PROFES-SIONAL (Southwestern Data Systems)	APPLE II	N	N	Y	300	79
	APPLE II	Y	Y	Y	to 9600	129
CROSSTALK (Microstuf)	CP/M MP/M MS-DOS	Y	Y	Y	300/ 1200	195
DATA CAPTURE IIe (Southeastern Software)	APPLE IIe	Y	Y	N	300/ 1200	90
DATALINK (Swifty Software)	ATARI	Y	Y	Y	300	39
DATALINK (Link Systems)	APPLE II	Y	Y	Y	1200	99
	IBM PC	Y	Y	Y	to 9600	199
I/TERM (Infosoft Syst.)	CP/M	N	N	N	1200	95
LOGON (Ferox Micro-Systems)	TRS-80 II APPLE II/III IBM PC	Y	Y	Y	1200	150
MICROLINK II (Digital Marketing)	CP/M CP/M-86 MS-DOS	Y	Y	Y	1200	99
MICRO-TERMINAL (Microcom)	APPLE II	Y	Y	Y	1200	84
	IBM PC	Y	Y	Y	1200	99
MODEM 80 (The Alternate Source)	TRS-80 I/III	Y	Y	Y	1200	39
P-TERM (Southwestern Data)	APPLE II	Y	Y	Y	300/ 1200	129
POST-TERM (Phil. Consulting)	TRS-80 I/II/III/4	Y	Y	N	300/ 1200	134
SMARTCOM I (Hayes)	APPLE II/III	Y	Y	Y	300	119
SMARTCOM II (Hayes)	IBM PC	Y	Y	Y	1200	149
TELELINK** (Atari Inc.)	ATARI	N	N	N	300	29
TELETALK (Datasoft)	ATARI	N	N	Y	1200	49
TELETARI (Don't Ask Software)	ATARI	Y	Y	N	to 9600	39
TERM 64* (Commodore)	COMMODORE 64	Y	N	N	300	9
TERMINAL (Texas Instruments)	EMULATOR II TI	Y	N	Y	300	24
VICTERM* (Commodore)	COMMODORE VIC-20	N	N	N	300	9
VIDEOTEXT PLUS (Tandy)	TRS-80 I/III/4	Y	N	Y	300	49
Z-TERM THE PRO (Southwestern Data)	APPLE II	Y	Y	Y	300/ 1200	149

* Cannot transfer files
* Cartridge

She Just Keeps Scrolling Along

CAROL SHAW, CREATOR OF THE BEST-SELLING GAME *RIVER RAID*, TALKS ABOUT THE UPS AND DOWNS OF GAME DESIGN.

BY JAMES DELSON

Carol Shaw, the imaginative game designer whose video-computer system (VCS) program River Raid *was so good it had to be translated for the computer to reach a wider audience, is a shy, quiet young woman who rarely raises her voice above a whisper. Her games reflect the fantasies she dreams up, not her Sunday school demeanor.*

Although she began programming computers in BASIC while in high school, it wasn't until Shaw moved on to FORTRAN and simple game design in college that she decided to make a career in the computer field. She received a B.S. and a masters degree in electrical engineering and computer science at the University of California at Berkeley in 1978, moving on to her first job as an industrial programmer before landing a job as a game designer at Atari.

Shaw believes that two of her programs for the Atari VCS, Checkers *and* 3-D Tic-Tac-Toe, *weren't particularly huge sellers because audiences didn't respond to that sort of straightforward adaptation of traditional strategy games. She left Atari and went to Activision, and in doing so altered her approach to design, inventing two games that have become extremely popular,* River Raid *and* Happy Trails. River Raid *was such a hit that Activision had Shaw translate and upgrade it to market the game for Atari computers.* [River Raid *costs $34.95 and is available in cartridge for the Atari 400/800/1200 XL.*]

When Shaw and I spoke at Activision's headquarters in Silicon Valley, she was working on a new, still-secret game. We began our conversation by examining her general approach to game design.

FC: Most people hate learning complex game rules. They want to get right into the action. People can play *River Raid* well enough to have a good time as soon as they insert the cartridge. Do you think that, in part, accounts for its popularity?

SHAW: When we came out with [our earlier game] *Checkers*, we discovered that pure-strategy games didn't go over, even when their rules are fairly simple. So in *River Raid*, I guess we aimed for something that was easy to pick up.

FC: As opposed to strategy games?

SHAW: Yeah, where it's all thinking and there's no action at all. They don't go over too well on the computer. I'm sure it's a part of the market that you could address, but it's a smaller market.

FC: Have your games always been fairly easy to play?

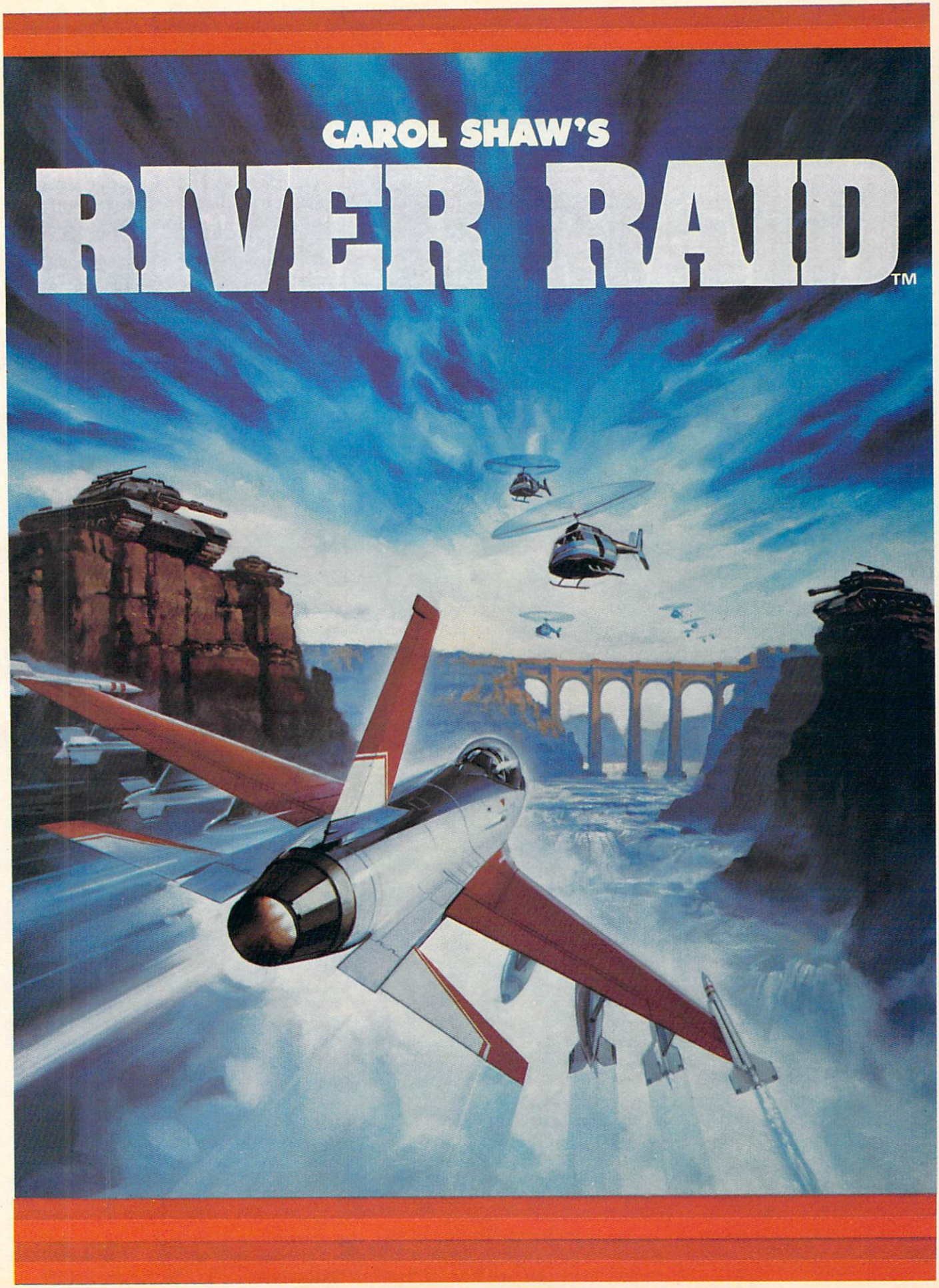
SHAW: When I first started, I wrote for the [Atari] 2600, and people who owned those wanted action games. That was the market we were aiming at.

FC: Are you heading in more sophisticated directions now?

SHAW: People are pretty much saturated with pure shoot-'em-up games, so I'm trying other ideas.

FC: What games have you been impressed by on the market?

JAMES DELSON *is the games critic of* FAMILY COMPUTING.


CAROL SHAW'S
RIVER RAID™

SHAW: *Archon*, where you're combining strategy with action—a really good idea.

FC: I tend to think that hybrids like *Archon*, *Broadsides*, and *Combat Leader* will come to dominate the market, edging out pure-strategy and pure-arcade programs. Have you given this much thought?

SHAW: There's always going to be a market for arcade games. It's just that it's not going to be the entire market.

FC: What do you see coming up, taking over the position arcade games hold now?

SHAW: Adventure games—they are really popular right now, in home computers. Of your top 10 games, half are adventures of one sort or another. And of course, then you have *Dragon's Lair*, in the arcades. That's going to start a big wave of laserdisk adventure-type things.

"I DON'T LIKE THE IDEA OF AIMING GAMES SPECIFICALLY FOR GIRLS OR WOMEN, BECAUSE ALL THAT'S DOING IS PERPETUATING THE STEREOTYPE THAT WOMEN DO OR LIKE CERTAIN THINGS."

FC: The game market is expanding very rapidly, yet there are enormous problems with many programs because they're available in only one format, for only one machine. How do you view this situation?

SHAW: That's the big problem. There isn't a standard system, like with record players all able to play the same kind of records. At this time you've got all sorts of different systems, so you've gotta rewrite the games for each one. Things will be easier when we standardize.

FC: Which machine do you recommend to write for?

SHAW: Well, the hard thing right now is trying to decide what machine to write for. If you finish a game a year from now, you have no idea which machine is going to be rising and which machine will be falling off.

FC: How do you go about designing games? Do you lay them all out on paper beforehand?

SHAW: Different people have different methods. Some people just put something up on the screen, then try to make a game out of it. Well, that's what some people do. I think they could start with sort of the basic concept. On *River Raid*, we wanted to create a thrilling shoot-'em-up game. I figured it would look better if I scrolled vertically, and I ended up with islands, so I said, "OK—it's a river."

FC: Have you always programmed your own games?

SHAW: All the other designers give advice. At one point [on *River Raid*] I was kind of stuck, because I couldn't figure out how to cram anything more into it. I had somebody look at it and make suggestions, because it's always easier to look at somebody else's code and say, "Well you could save bytes here and here." You just get so caught up in your own code that you can't see those kinds of things anymore.

FC: Do you think about going on and making *River Raid II* or some sort of sequel, where if you make it through a certain number of bridges, you can go on to a tougher game?

SHAW: Well, no, I think I'm through with *River Raid*. If someone else wants to do it on another system, they can do it.

FC: It seems to me that when you work for a big company like this, turning out products on a fairly regular basis, there's got to be some competition among the programmers. Not so much to come up with better games than anyone else has ever devised, but to push one another along. Is the atmosphere here kind of a think-tank atmosphere, with a lot of interplay among the various programmers?

SHAW: I don't know if you'd call it a think tank, but we offer one another a lot of suggestions. One person is the main programmer, but he accepts ideas from everyone else in his group of five or six people. That seems to work really well, because we figure if everyone in the group likes the game, then it has a fairly good chance. If people don't like the game, if it's really not working out, we kind of encourage the others to drop it. But we don't like to do that too much, because maybe they'll come up with some game play that'll make it the next great hit, even if it doesn't look like it's working out.

FC: And at how many steps along the way, in the six months it takes you to design a game, do you stop and give it a severe appraisal? How many times can you say, "This has gone far enough, this is not going to work," or "OK, going great, go ahead?"

SHAW: Well, so far it's been fairly informal. We're thinking of having weekly meetings to discuss problems, but until now it's been up to the individual. Some people don't like to have anybody look at their games until they're almost done. And other people like to have input as they go along. So it kind of depends.

FC: How do you play-test one another's games before they're thrown out to the public?

SHAW: We do the play-testing pretty much within the company or with relatives and friends. If all those people like it, then it's probably gonna be a good game. That's when we give it to marketing, which does its own testing to figure out where to aim the advertising.

FC: And do you have any input into packaging, advertising, choosing the game's name?

SHAW: A little. We are the editorial development department, and we have another department that does the packaging and picks the names of the games. If we really hate the name that they pick for our game, we try to come up with another one. But we pretty much leave them on their own.

FC: How can game companies exist on copying other people's programs? Is it much easier to be given a *Pac-Man* system and be told, "Give us something that gobbles little dots and goes around mazes?"

SHAW: Well, it's really hard to come up with something completely original. Every game borrows from what went before, even *Pac-Man*. There had been previous games where you had dots, although they weren't as charmingly done. It's easier to borrow than trying to come up with a new game idea, although to do *Pac-Man* exactly is fairly difficult. You've gotta figure out what all the rules are, and it's pretty hard if you want to transfer the game with all the rules intact.

I always find it easier to try to come up with something original than to try to translate a game from one system to another. Especially when you have to look at somebody else's code and try to figure out, "Now, what did they do?"

FC: Do you design for a specific age group or skill level?

SHAW: I design, I guess, for a particular class. *Happy Trails* is designed for people who like mazes. It doesn't matter how old they are or what sex they are. I don't like the idea of aiming games specifically for girls or women, because all that's doing is perpetuating the stereotype that women do or like certain things.

FC: Many people are afraid of computers. And it's not the fear that the hardware's going to be outmoded. They are afraid of this hunk of metal that is going to be invading their houses. What do you say to people who come to you, asking about computers?

SHAW: I think games are really getting people into computers more. Kids realize you can play games with them, which makes them immediately nonthreatening. But it's hard for the adults. I don't think that everybody really needs to have a computer. It's a great thing to have, but I don't think people should rush out and just buy one because they feel that they should and then just have it sit there and not use it.

FC: Do you think there's any future in trying to keep video game systems like the 2600 alive when it seems that more and more people are interested in personal computers that can do much more?

When playing River Raid, *the further you travel, the more obstacles you encounter.*

SHAW: Well, I think this sort of thing will be around as a low-cost game machine, but making it into a computer is silly. You can buy a complete computer for $100; why [buy] a keyboard that you stick on a 2600 for $100?

FC: When I walk into record stores and computer stores, they have bins filled with VCS cartridges marked down to $3 or $5. There are some companies that have no games out on the shelves anymore. All their software is dumped into the bargain bin. Is there any way of protecting yourself against being outmoded before your game hits the market or as it's hitting the market?

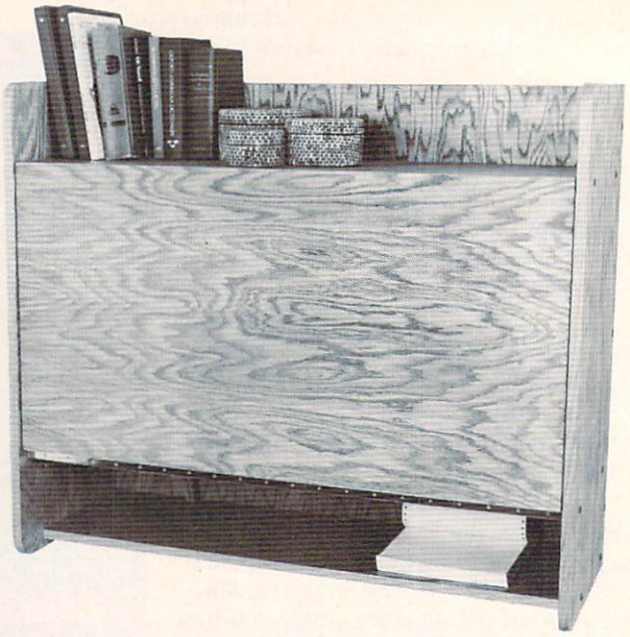
"IT'S HARD TO COME UP WITH SOMETHING COMPLETELY ORIGINAL. EVERY GAME BORROWS FROM WHAT WENT BEFORE."

SHAW: Well, you try to come up with something different, which we did with *Pitfall*. If you want to have a really big hit, you can't just go and copy what's been done 10 times on the same system. It might do fairly well, but it's not going to be a gigantic success.

FC: When trying to figure out what's going to work and what's not, do you have a group of friends you consult, or do you rely fundamentally on your own taste?

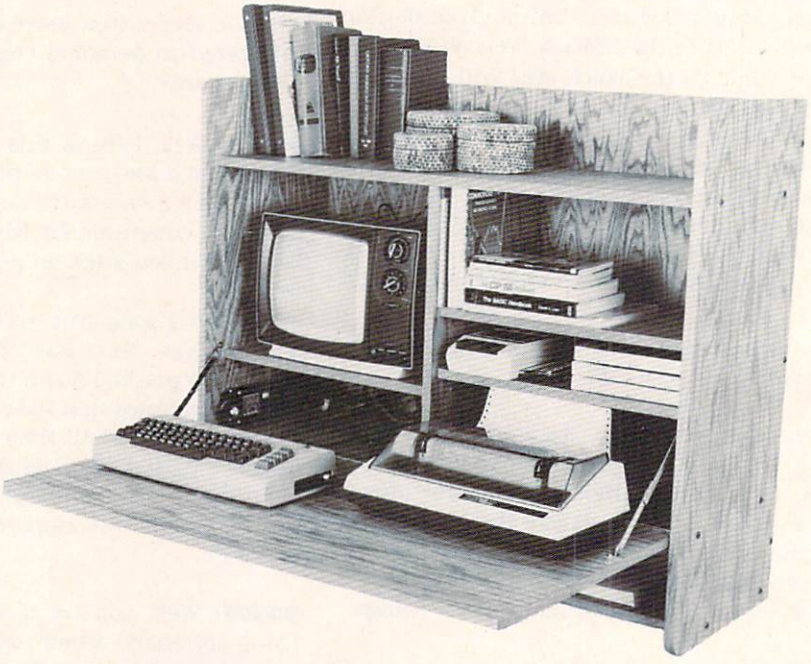
SHAW: We rely on friends sometimes, or just watch the market trends. It used to be that all games were shoot-'em-ups. Now we're having more of a trend toward the cute-type cartoon games. So you might look at that and say, "All right, we have enough shoot-'em-ups." Or you might say, "Well, nobody's doing shoot-'em-ups anymore, let's do another one." It is really hard to try to come up with something. FC

How to Build a Computer Carrel



SOLVE THE "WHERE TO PUT IT?" PROBLEM BY BUILDING OUR "MURPHY BED" COMPUTER DESK UNIT.

BY GENE AND KATIE HAMILTON



This wall-mounted computer desk is styled after the famous Murphy bed, designed to fold itself away into a wall. A large drop front, which provides a work area when extended, folds up to conceal your computer and peripherals when not in use. Shelves provide storage for books and printer paper. If security or sticky fingers are a concern, install a lock in the drop-down panel.

Our computer carrel is made of oak plywood with the bare ends concealed by thin iron-on strips of oak. The materials cost us $125. If you use standard plywood and paint it, you can cut the materials cost in half.

Construction is quick because the carrel is designed as knock-down furniture, without glue joints or screws. Instead, all joinery is by special knock-down fittings. This furniture hardware requires that two holes be drilled and is easily aligned.

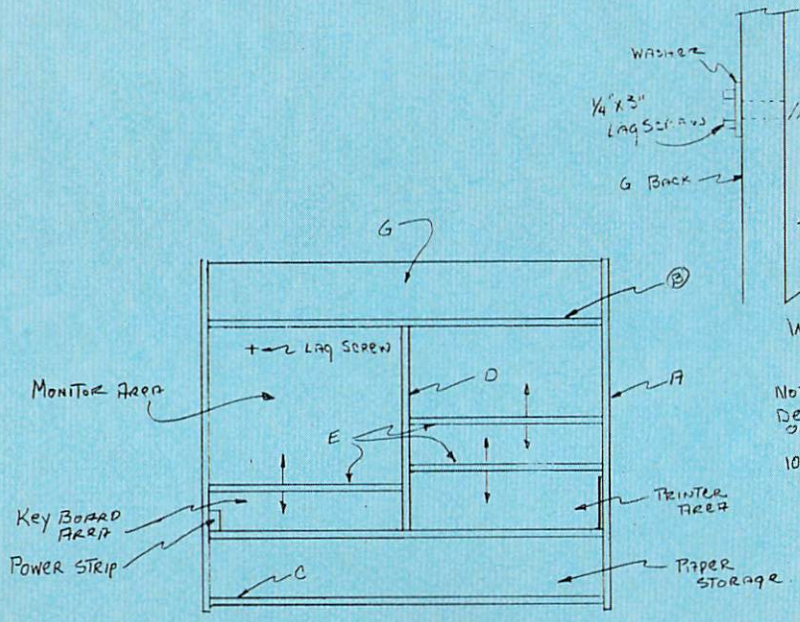
Each knock-down fitting consists of two parts—a fastener and a dowel—that fit together in typical male-female fashion. The fastener screws through one piece of wood and into another. In the second piece it fits into a dowel, which holds it in place. The dowel also screws into the wood, and has an aperture to accept the fastener (see Knock-Down Fitting detail on blueprint). The beauty of knock-down fittings is that they can be "knocked down," or taken apart, and reconstructed without any damage to the wood. They provide, in short, a much cleaner method of construction than conventional screws or nails.

Knock-down fittings have long been used by professional furniture makers, but have recently become available to consumers. The fittings we used and measured for are from The Woodworkers' Store (address in Shopping List). If you find another type at a hardware store, be sure to make adjustments in your measurements.

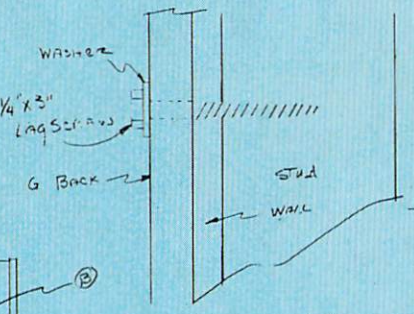
Before you begin, look at the plans and photos, and read the instructions through once. Second, measure all your components. Our plan provides for an inside clearance of 14 inches front to back. These measurements are adequate for most keyboard-type computers, but check the size of your disk drives and printer. You can easily increase the depth of the carrel by enlarging the width of the sides, shelves, and divider; all other measurements remain unchanged. →

GENE *and* KATIE HAMILTON *are a writing and photography team from Elmhurst, Illinois, specializing in "how-to" building projects. Their last article for* FAMILY COMPUTING *was "How to Build a Printer Muffler for Under $20," in the November issue.*

CARREL BLUEPRINT

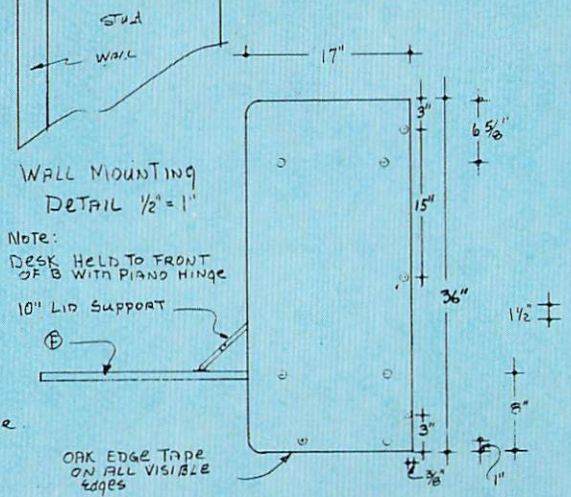


FRONT VIEW
OPEN

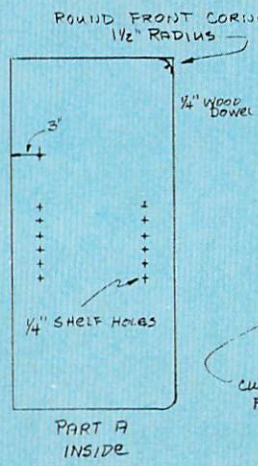


WALL MOUNTING
DETAIL 1/2" = 1"

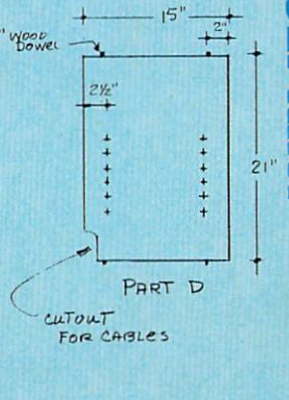
NOTE:
DESK HELD TO FRONT OF B WITH PIANO HINGE



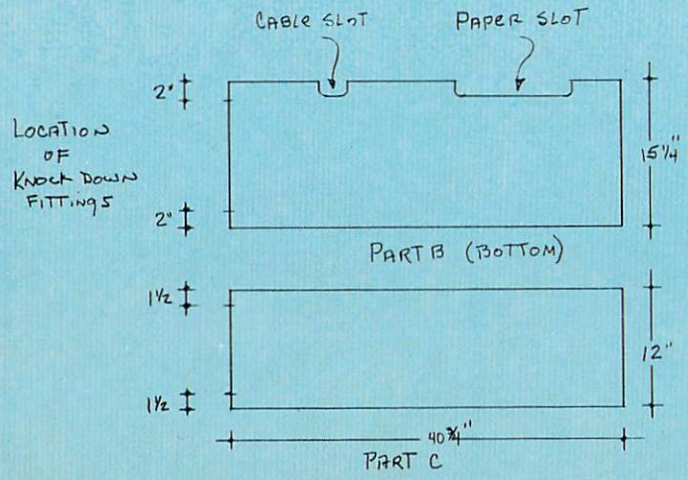
SIDE VIEW
OPEN

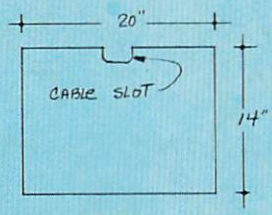


PART A
INSIDE

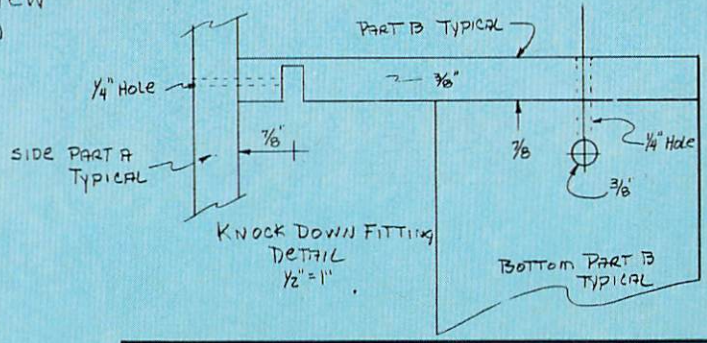


PART D





PART E



COMPUTER CARREL		
SCALE:	APPROVED BY:	DRAWN BY SH
DATE: 09·10·83		REVISED
for FAMILY COMPUTING		
BY The HAMILTONS 371 MAPLE ELMHURST IL 60126		DRAWING NUMBER 1159·1

18 X 18 PRINTED ON NO. 1000H-10 CLEARPRINT FADE-OUT

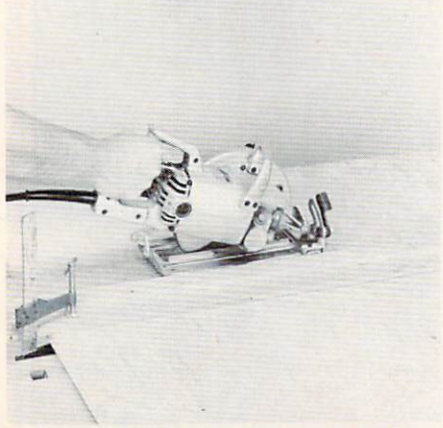
SHOPPING LIST

Item	Quantity
¾" × 4' × 8' oak plywood	2 sheets
¾" × 1/16" oak edging	40 ft.
⅜" hardwood dowels	1 ft.
Knock-Down fittings #D6600 (The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374; (612) 428-4101)	20
48" brass piano hinge	1
Lid supports (standard hardware item; Stanley Hardware or equivalent)	1 set
Magnetic cabinet latch (standard hardware item)	2
¼" × 3" lag screw and washer	3
Six-plug power strip (standard hardware or Radio Shack item)	1
Wood glue tube	small
Minwax #210B golden oak	½ pt.
Minwax Antique oil finish	1 pt.

CUTTING LIST

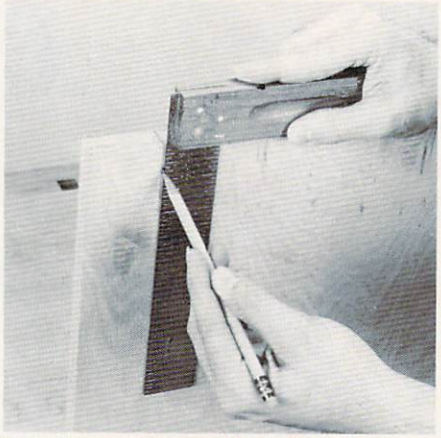
Key	Pcs.	Size & Description
A	2	¾" × 17" × 36" oak ply. (side)
B	2	¾" × 15¼" × 40¾" oak ply. (top/bottom)
C	1	¾" × 12" × 40¾" oak ply. (bottom shelf)
D	1	¾" × 15" × 21" oak ply. (divider)
E	3	¾" × 14" × 20" oak ply. (shelf)
F	1	¾" × 21½" × 40¾" oak ply. (desk top)
G	1	¾" × 35½" × 40¾" oak ply. (back)

1. To start, lay out and cut sides (A), top/bottom (B), bottom shelf (C), and back (G) to size (see Cutting List). If you cut the plywood with a circular saw, keep the good side of the wood down. If using a hand saw, the good side should be face up.



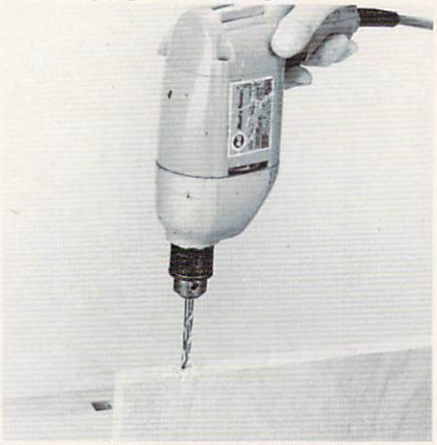
Clamp a straight board to the large sheet of plywood to guide your saw when cutting parts.

2. Use a T square to lay out the position of all fastener holes (see plan). First, mark the position of the edge holes on the top/bottom (B). Decide which is the front edge and mark the location of the fastener holes with your T square. Then transfer this location to the underside of the part.



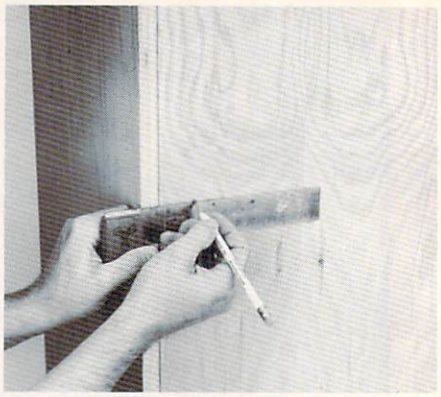
Use a T square to lay out the location of the steel dowel hole. Measure ⅞ inches down from the edge of the panel.

3. Drill several test-hole combinations in scrap and try the fittings before drilling your actual fitting holes. Then drill a ¼-inch hole at least 2 inches deep into the edge of (B) and (C). Keep the drill square with the edge or use a doweling jig to help alignment.



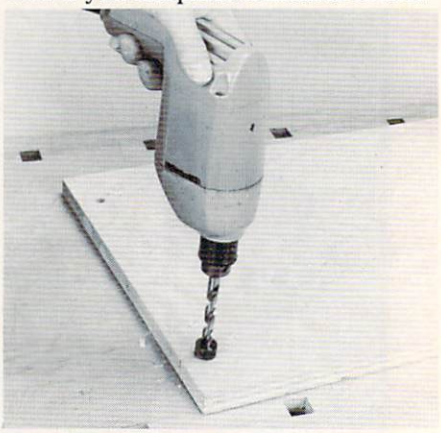
Keep your drill square to the sides when drilling the ¼-inch edge hole for the fastener screw.

4. Then drill a ⅜-inch hole in the underside of the part for the cross dowel. The steel cross dowel is located ⅞ inches back from the edge (see Knock-Down Fitting detail on plan). Put tape on the drill to act as a depth gauge to prevent you from drilling completely through.



Lay out the fastener holes on the back and transfer their locations to the sides.

5. Lay out and drill the fastener and dowel holes in the edges and backside of G in the same way. These holes should be 3 inches from the top and bottom, and 18 inches on center, as indicated on the Side View Open detail. Next, transfer the fitting hole locations from (B), (C), and (G) to the sides (A). Use your T square to draw layout lines across the inside surface of the sides according to the plan (see Side View Open detail). Then place the horizontal parts in place, align them with the lines, and transfer the fastener locations to the sides. This procedure ensures that the holes will be in perfect alignment even if you misplace a measurement.



When drilling the steel dowel hole, place tape or use a depth stop set at a ½-inch depth to prevent drilling through the plywood.

6. Assembling the computer carrel is next. If you have a misalignment, drill a slightly oversize dowel hole to allow for repositioning. Check the measurement between the top and bottom. If the difference is more or less than 21 inches, the plan calls for adjusting the length of divider (D) to fit.

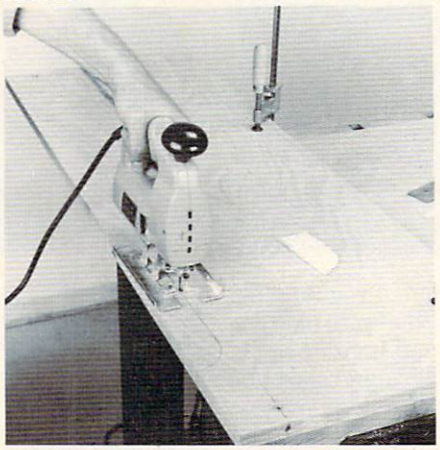
7. Cut the divider to size. It is held in place with wood dowels instead of steel fasteners. Lay out the location of the dowel holes in its ends as you did for the

fasteners. Drill ⅜-inch holes ¾-inches deep for short wood dowels. Then transfer the hole locations to the center of the lower surface of the top (B1) and top surface of the bottom (B2). Drill ½-inch-deep holes through these marks. Then insert 1-inch sections of hardwood dowels into the divider edge holes and put the divider in place.

8. The movable shelves are held in place with plug-type shelf supports. Lay out the plug-hole locations on the inside surface of the sides and divider (see plan). Then drill ¼-inch holes through these layout marks. Be careful not to drill through the side.

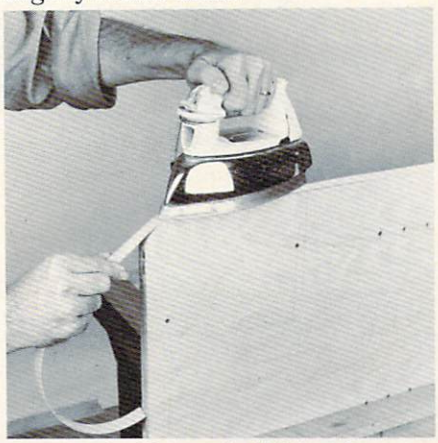
Lay out the position of the ¼-inch holes for the shelf brackets on (A) first, and transfer to (D).

9. Use a coping or saber saw to cut out the cable passages in the rear of the shelves, divider, and bottom (see plan). Make the cutout in the left rear of the bottom at least 10 inches wide to accommodate fanfold paper, which you can store on the shelf below. Then cut the front side corners to a 1½-inch radius.



Make a cardboard pattern to lay out the paper and cable passage. Then cut out with a saber or handsaw.

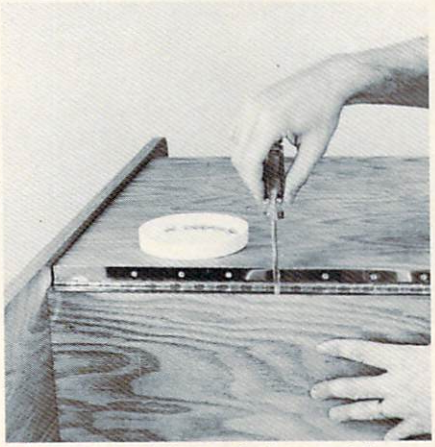
10. Apply strips of thin oak with a standard iron set at high heat. Cut the strip to size and apply with light pressure. When all the exposed ends (except the front of the bottom shelf [B2]) are covered, sand all edges to slightly round them.



Use a standard iron set for high heat (turn steam off) to attach the oak strip edging. Sand edges smooth when finished.

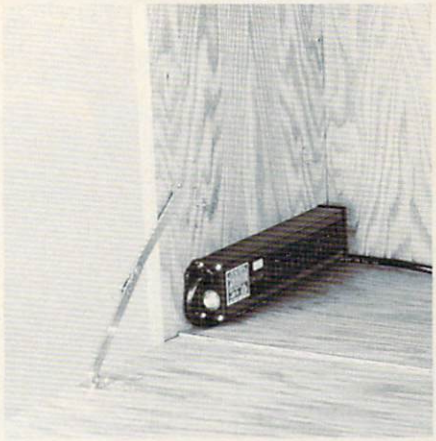
11. We finished our carrel with a coat of Minwax and applied a rub-on Antique oil finish because the combination is easy to apply and leaves a durable surface.

12. When the finish has dried, complete the assembly of your carrel. Attach the drop desk (F) to the front of the bottom shelf with a piano hinge. Cut the hinge to 40½ inches (they come in standard 48-inch lengths). Install it on the desk top. Use a nail set to make starting holes for the small screws. Then place (F) in position, align it, and screw the hinge to the front of (B).



Attach the piano hinge to the bottom of the desktop first. Then put (F) in position and fasten the hinge to the front of (B).

13. The desk top is held level with lid supports. Turn the carrel upright and prop the desk top open with a support from below. Install the lid supports according to the manufacturer's directions. Then install magnetic latches in the upper corners.



Install the lid supports and power strip. Note the shelf bracket positioned to hold monitor shelf.

14. Your computer carrel is held to the wall with three 3-inch-long, ¼-inch lag screws. Because the carrel will be heavy when loaded with computer gear and books, it should be mounted securely to the wall studs.

Your carrel spans three studs, which are normally located 16 inches apart from each other. Mark the center of the back of your carrel and measure 16 inches from this point in both directions, marking these points. Drill mounting holes for the lag screws along these lines. Locate these holes on the stud lines about 8 inches down from the top of the back for the outside screws, and just above the top shelf in the center.

15. Locate the carrel so the desk surface is about 27 inches from the floor or to suit your needs. All you have to do now is install the shelves, hook up your computer, and plug in the power strip. FC

When installing shelves, either cut the shelves ⅛ inch short to allow room for brackets, or cut ⅛-inch notches in the ends of the shelves (E).

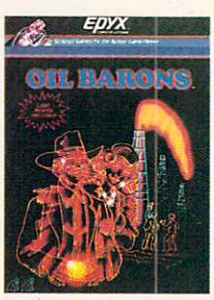
OIL BARONS.™
IF YOU'RE SMART, YOU'LL GET FILTHY RICH.

Are you a gambler, eager for new challenges... ready to pit your skill and luck against others in an attempt to corner the world oil market? If so, Oil Barons is your game.

Starting with 4 parcels of land and over $1 million, you search for that ever-elusive gusher. The computer does all the work, including banking and scorekeeping, freeing you to plan your strategy and make decisions that will ultimately determine your success.

Obstacles like government regulations, well fires, and hurricanes complicate matters, but the fun of increased land holding, striking it rich, and even unloading worthless parcels on the uninitiated, more than make up for the setbacks.

One to eight players, 4 color gameboard and playing pieces included, keyboard controlled.



EPYX™ COMPUTER SOFTWARE

Strategy Games for the Action-Game Player

the Programmer

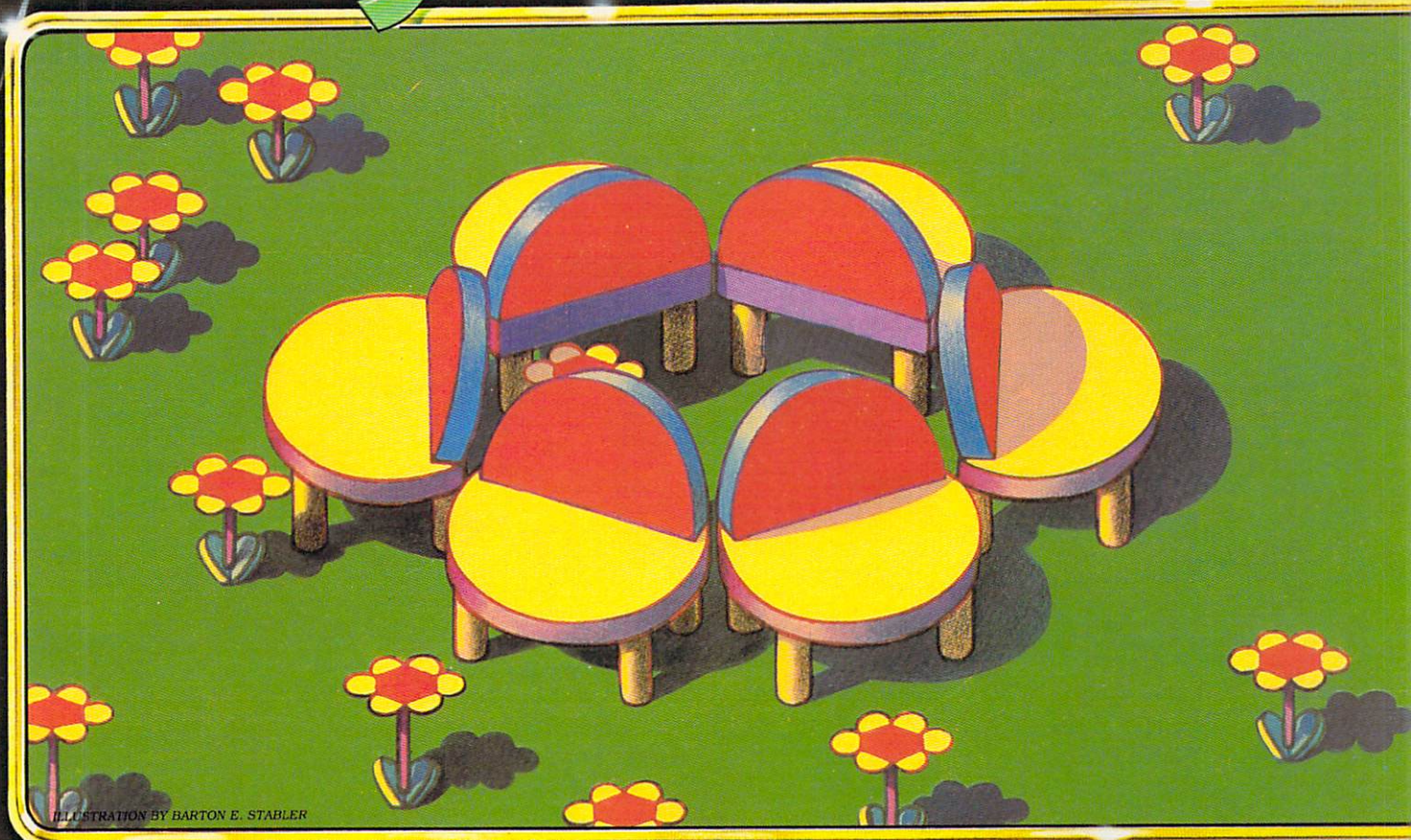


ILLUSTRATION BY BARTON E. STABLER

★ M A R C H ★

SPRING PROGRAMS
Page 78

Discover a green thumb in your computer; a perfect rainy day activity for kids; and a program that helps kids budget their allowance.

PUZZLE
Page 100

A moldy old diary discovered on the grounds of your new home becomes the key to nighttime hauntings.

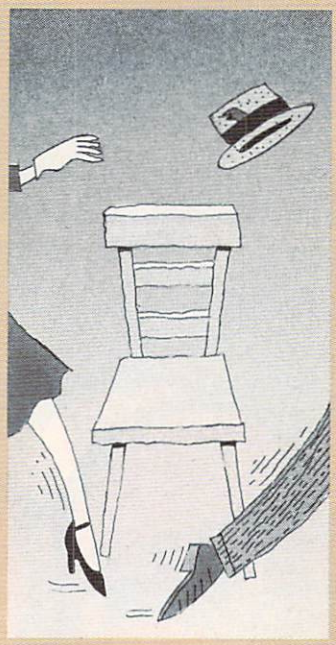
READER-WRITTEN PROGRAM
Page 109

Balance in all things is important, but it's essential to winning this tricky game of *Scales*.

ILLUSTRATION BY JIM CHERRY III

MUSICAL CHAIRS

BY JOEY LATIMER



Here's a perfect rainy day activity for kids. Now your computer can lead an old-fashioned game of *Musical Chairs*!

First set up a circle of chairs, facing outwards, one short the total number of players. An old nursery rhyme will play as soon as you run the program, while the players should begin to march around the outside of the circle. When the music suddenly stops, each player should jump into a chair. The player left standing is out of the game. Remove another chair, press the RETURN or ENTER key for the music to start up again, and enjoy an afternoon of endless surprise!

TRS-80 Color Computer/*Musical Chairs*

```
50 CLS
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "PRESSING <ENTER>"
90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
130 INPUT "READY? PRESS <ENTER>";R$
150 T=INT(RND(57))+15
160 RESTORE
170 C=0
180 CLS
190 IF C>=T THEN 370
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 CLS(RND(9)-1)
270 READ PTCH,DRTN
280 SOUND PTCH,DRTN
340 C=C+1
350 GOTO 190
370 CLS
390 PRINT "REMOVE A CHAIR. THEN"
400 PRINT "PRESS <ENTER> TO"
410 INPUT "START THE MUSIC AGAIN.";R$
430 GOTO 150
1000 DATA 204,6,210,2,204,4,197,4,193,4,197,4
1010 DATA 204,8,185,4,193,4,197,8,193,4,197,4
1020 DATA 204,8,204,6,210,2,204,4,197,4,193,4
1030 DATA 197,4,204,8,185,8,204,8,193,4,176,12
```

Apple/*Musical Chairs*

```
10 FOR X=1 TO 77
20 READ Y
30 IF X>48 THEN POKE 719+X,Y
40 NEXT X
50 HOME
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "PRESSING <RETURN>"
90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
130 INPUT "READY? PRESS <RETURN>";R$
150 T=INT(RND(1)*57)+15
160 RESTORE
170 C=0
180 GR
190 IF C>=T THEN 360
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 COLOR=INT(RND(1)*16)
250 PLOT INT(RND(1)*39),INT(RND(1)*39)
270 READ PTCH,DURN
280 POKE 8,PTCH
290 POKE 6,DURN
300 CALL 768
340 C=C+1
350 GOTO 190
360 TEXT
370 HOME
390 PRINT "REMOVE A CHAIR. THEN"
400 PRINT "PRESS <RETURN> TO"
410 INPUT "START THE MUSIC AGAIN";R$
430 GOTO 150
1000 DATA 140,106,124,32,140,74,160,74,170,74,160,74
1010 DATA 140,128,185,74,170,74,160,128,170,72,160,72
1020 DATA 140,128,140,106,124,32,140,74,160,74,170,74
1030 DATA 160,74,140,128,185,74,140,128,170,74,215,25
5
2000 DATA 165,8,74,133,9,164,8,173,48,192,136
2010 DATA 234,234,208,251,165,7,56,229,9,133
2020 DATA 7,176,237,198,6,208,233,96
```

Atari/*Musical Chairs*

```
10 DIM R$(1)
50 PRINT CHR$(125)
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "PRESSING <RETURN>"
90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
130 PRINT "READY? PRESS <RETURN>";
140 INPUT R$
150 T=INT(RND(1)*57)+15
160 RESTORE
170 C=0
180 PRINT CHR$(125)
190 IF C>=T THEN 360
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 SETCOLOR 4,INT(RND(1)*15),10
250 SETCOLOR 2,INT(RND(1)*15),10
270 READ PTCH,DUR
280 SOUND 0,PTCH,10,15
300 FOR DE=1 TO DUR
310 NEXT DE
320 SOUND 0,0,0,0
340 C=C+1
350 GOTO 190
360 SETCOLOR 2,11,4
370 SETCOLOR 4,11,10
390 PRINT "REMOVE A CHAIR. THEN"
400 PRINT "PRESS <RETURN> TO"
```

→

ILLUSTRATIONS BY JOSH GOSFIELD

An educational ad about educational software.

YOU studied all the computers and finally chose the one your family found most useful. One of the main reasons you wanted a computer in the first place is to help your children in school. Not just to teach them how to use a computer, but also to help them get good grades in basic school subjects like reading or geography.

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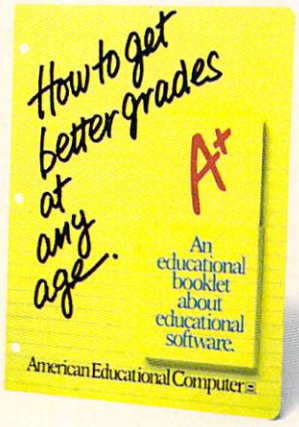

Look for our display in your favorite software store, and pick up your free educational leaflet.

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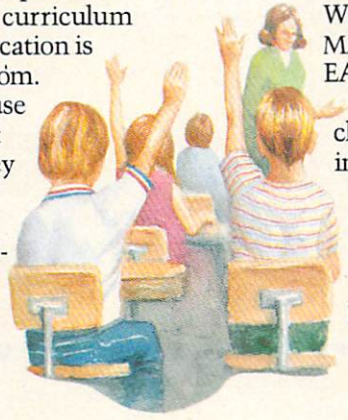

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```
410 PRINT "START THE MUSIC AGAIN";
420 INPUT R$
430 GOTO 150
1000 DATA 81,125,72,42,81,83,91,83,96,83,91,83
1010 DATA 81,167,108,83,96,83,91,167,96,83,91,83
1020 DATA 81,167,81,125,72,42,81,83,91,83,96,83
1030 DATA 91,83,81,167,108,167,81,167,96,83,121,333
```

Commodore 64/*Musical Chairs*

```
10 POKE 54296,15
20 POKE 54277,72
30 POKE 54278,132
40 POKE 54276,33
50 PRINT CHR$(147)
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "PRESSING <RETURN>"
90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
130 INPUT "READY? PRESS <RETURN>";R$
150 T=INT(RND(1)*57)+15
160 RESTORE
170 C=0
180 PRINT CHR$(147)
190 IF C>=T THEN 370
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 POKE 53280,INT(RND(0)*15)+1
250 POKE 53281,INT(RND(0)*15)+1
270 READ HF,LF,DUR
280 POKE 54273,HF
290 POKE 54272,LF
300 FOR DE=1 TO DUR
310 NEXT DE
320 POKE 54272,0
330 POKE 54273,0
340 C=C+1
350 GOTO 190
370 POKE 53281,6
390 PRINT"REMOVE A CHAIR. THEN"
400 PRINT"PRESS <RETURN> TO"
410 INPUT"START THE MUSIC AGAIN.";R$
430 GOTO 150
1000 DATA 25,30,183,28,49,62,25,30,125,22,96,125,21,31
,125,22,96,125
1010 DATA 25,30,250,18,209,125,21,31,125,22,96,250,21,
31,125,22,96,125
1020 DATA 25,30,250,25,30,183,28,49,63,25,30,125,22,96
,125,21,31,125
1030 DATA 22,96,125,25,30,250,18,209,250,25,30,250,21,
31,125,16,195,500
```

IBM PC/*Musical Chairs*

```
50 CLS
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "Pressing <RETURN>"
90 PRINT "starts the music. The"
100 PRINT "music may stop at any"
110 PRINT "time."
120 PRINT
130 INPUT "Ready? Press <RETURN>";R$
150 T=INT(RND(1)*57)+15
160 RESTORE
170 C=0
180 CLS
190 IF C>=T THEN 360
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 COLOR 1,INT(RND(1)*8),INT(RND(1)*16)
250 CLS
270 READ PTCH,DRTN
280 SOUND PTCH,DRTN
340 C=C+1
350 GOTO 190
360 COLOR 7,0,0
370 CLS
390 PRINT "Remove a chair. Then"
400 PRINT "press <RETURN> to"
410 INPUT "start the music again.";R$
430 GOTO 150
1000 DATA 392,6,440,2,392,4,350,4,330,4,350,4
1010 DATA 392,8,294,4,330,4,350,8,330,4,350,4
1020 DATA 392,8,392,6,440,2,392,4,350,4,330,4
1030 DATA 350,4,392,8,294,8,392,8,330,4,262,12
```

TI-99/4A/*Musical Chairs*

```
10 RANDOMIZE
50 CALL CLEAR
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "Pressing <ENTER>"
90 PRINT "starts the music.  The"
100 PRINT "music may stop at any"
110 PRINT "time."
120 PRINT
130 PRINT "Ready? Press <ENTER>";
140 INPUT R$
150 T=INT(RND*57)+15
160 RESTORE
170 C=0
180 CALL CLEAR
190 IF C>=T THEN 360
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 CALL COLOR(1,INT(RND*16)+1,INT(RND*16)+1)
270 READ PTCH,DRTN
280 CALL SOUND(DRTN,PTCH,10)
340 C=C+1
350 GOTO 190
360 CALL COLOR(1,2,1)
390 PRINT "Remove a chair. Then"
400 PRINT "Press <ENTER> to"
410 PRINT "start the music again.";
420 INPUT R$
430 GOTO 150
1000 DATA 784,300,880,100,784,200,698,200,659,200
1010 DATA 698,200,784,400,587,200,659,200,698,400
1020 DATA 659,200,698,200,784,400,784,300,880,100
1030 DATA 784,200,698,200,659,200,698,200,784,400
1040 DATA 587,400,784,400,659,200,523,600
```

Timex Sinclair 2068/*Musical Chairs*

```
 10 RANDOMIZE
 50 CLS
 60 PRINT "MUSICAL CHAIRS PROGRAM"
 70 PRINT
 80 PRINT "PRESSING <ENTER>"
 90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
```

→

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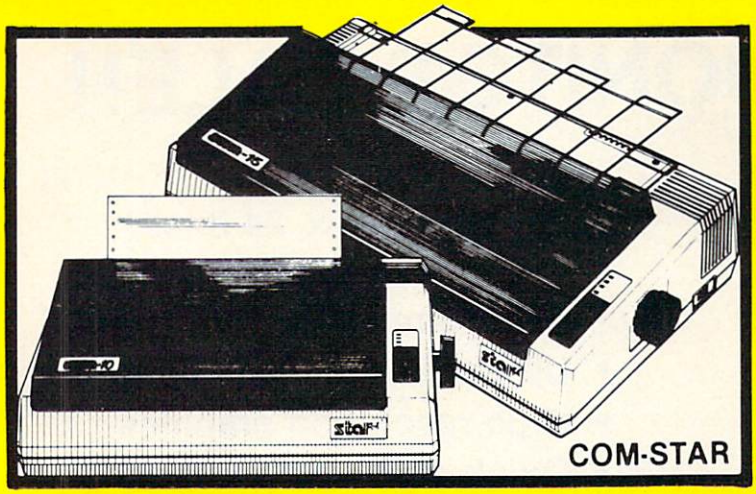

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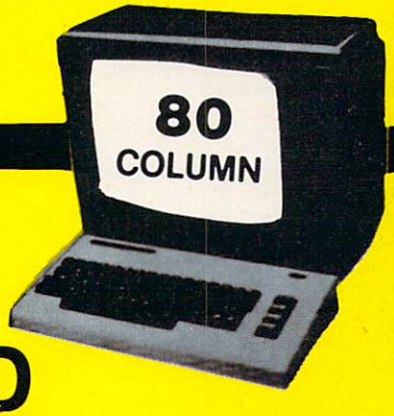

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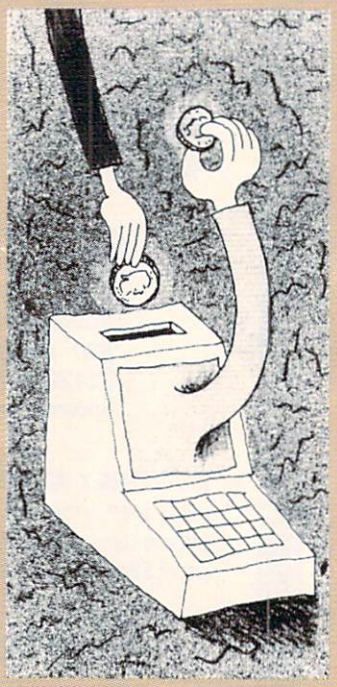
```
130 INPUT "READY? PRESS <ENTER>";R$
150 LET T=INT(RND*57)+15
160 RESTORE
170 LET C=0
180 CLS
190 IF C>=T THEN GOTO 360
200 IF C<24 THEN GOTO 240
210 RESTORE
220 LET T=T-C
230 LET C=0
240 BORDER INT(RND*8)
250 PAPER INT(RND*8)
260 CLS
270 READ PTCH,DRTN
280 BEEP DRTN,PTCH
340 LET C=C+1
350 GOTO 190
360 BORDER 7
370 PAPER 7
380 CLS
390 PRINT "REMOVE A CHAIR. THEN"
400 PRINT "PRESS <ENTER> TO"
410 PRINT "START THE MUSIC AGAIN.";R$
420 INPUT R$
430 GOTO 150
1000 DATA 7,.3,9,.1,7,.2,5,.2,4,.2,5,.2,7,.4
1010 DATA 2,.2,4,.2,5,.4,4,.2,5,.2,7,.4
1020 DATA 7,.3,9,.1,7,.2,5,.2,4,.2,5,.2,7,.4
1030 DATA 2,.4,7,.4,4,.2,0,.6
```

VIC-20/*Musical Chairs*

```
10 POKE 36878,15
50 PRINT CHR$(147)
60 PRINT "MUSICAL CHAIRS PROGRAM"
70 PRINT
80 PRINT "PRESSING <RETURN>"
90 PRINT "STARTS THE MUSIC. THE"
100 PRINT "MUSIC MAY STOP AT ANY"
110 PRINT "TIME."
120 PRINT
130 INPUT "READY? PRESS <RETURN>";R$
150 T=INT(RND(1)*57)+15
160 RESTORE
170 C=0
180 PRINT CHR$(147)
190 IF C>=T THEN 360
200 IF C<24 THEN 240
210 RESTORE
220 T=T-C
230 C=0
240 POKE 36879,INT(RND(0)*255)+1
270 READ PTCH,DRTN
280 POKE 36875,PTCH
300 FOR DE=1 TO DRTN
310 NEXT DE
320 POKE 36875,0
340 C=C+1
350 GOTO 190
360 POKE 36879,27
390 PRINT "REMOVE A CHAIR. THEN"
400 PRINT"PRESS <RETURN> TO"
410 INPUT"START THE MUSIC AGAIN.";R$
430 GOTO 150
1000 DATA 215,183,219,62,215,125,209,125,207,125,209
1010 DATA 125,215,250,201,125,207,125,209,250,207,125
1020 DATA 209,125,215,250,215,183,219,63,215,125,209
1030 DATA 125,207,125,209,125,215,250,201,250,215,250
1040 DATA 207,125,195,500
```

KIDS' ALLOWANCE PLANNER

BY JOEY LATIMER



Every time you walk past the toy store, does your heart ache for that special something in the window? Are your cries of "Can you ple-e-ease buy it for me, Mom?" falling on deaf ears? Is your birthday too far off to wait, and is Christmas even further?

Well, you'll just have to buy it with your allowance. If your reply is "What allowance? I've spent it all!" then this budget program is for you! It will ask you for your current savings and the cost of your planned purchase(s), then tell you how much money you'll have left. And if you're over budget, it will estimate when in the future you can afford your purchase(s), based on the sum of your weekly allowance and/or any other weekly earnings you might have.

ADAM & Apple/*Kids' Allowance Planner*

```
20 DIM T$(100),C(100)
40 HOME
50 PRINT "PRESS <RETURN>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 HOME
110 PRINT "ALL RIGHT ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X = 0
340 M = 0
350 HOME
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S - M
380 PRINT
```

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```
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P + M < = S THEN GOTO 650
500 PRINT "SORRY, ";N$;
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A + E < = 0 THEN GOTO 840
540 W = (P - (S - M)) / (A + E)
550 IF W = INT(W) THEN GOTO 570
560 W = INT(W) + 1
570 PRINT "BUT IF YOU SAVE $";A + E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEKS."
600 PRINT
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$ = "Y" THEN GOTO 330
640 GOTO 840
650 X = X + 1
660 T$(X) = B$
670 C(X) = P
680 M = M + P
690 HOME
700 PRINT "AFTER BUYING ..."
710 PRINT
720 PRINT "ITEM","COST"
730 PRINT "----","----"
740 FOR J = 1 TO X
750 IF J / 14 > INT(J / 14) THEN GOTO 790
760 PRINT " (PRESS <RETURN> ...)"
770 INPUT R$
780 HOME
790 PRINT T$(J),C(J)
800 NEXT J
810 PRINT
820 PRINT "YOU'LL HAVE"
830 PRINT "$";S - M;" LEFT."
840 PRINT
850 PRINT "DO YOU WANT TO BUY"
860 PRINT "SOMETHING ELSE? (Y/N)"
870 INPUT R$
880 IF R$ = "Y" THEN GOTO 350
890 IF R$ <> "N" THEN GOTO 870
900 PRINT
910 PRINT "YOU HAD $";S
920 PRINT "YOU SPENT $";M
930 PRINT "YOU'VE GOT $";S - M
```

Atari/*Kids' Allowance Planner*

```
20 DIM T$(1500),L(100),C(100),N$(15),B$(15),R$(1)
40 PRINT CHR$(125)
50 PRINT "PRESS <RETURN>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 PRINT CHR$(125)
110 PRINT "ALL RIGHT, ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X=0
340 M=0
350 PRINT CHR$(125)
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S-M;"."
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P+M<=S THEN 650
500 PRINT "SORRY, ";N$;","
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN 850
540 W=(P-(S-M))/(A+E)
550 IF W=INT(W) THEN 570
560 W=INT(W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEK(S)."
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$="Y" THEN 330
640 GOTO 850
650 X=X+1
660 L(X)=X*15+LEN(B$)-1
670 T$(X*15,L(X))=B$
680 C(X)=P
690 M=M+P
700 PRINT CHR$(125)
710 PRINT "AFTER BUYING ..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "-----","-----"
750 FOR J=1 TO X
760 IF J/12>INT(J/12) THEN 800
770 PRINT " PRESS <RETURN> ...)"
780 INPUT R$
790 PRINT CHR$(125)
800 PRINT T$(J*15,L(J)),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU'LL HAVE"
840 PRINT "$";S-M;" LEFT."
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN 350
900 IF R$<>"N" THEN 880
910 PRINT
920 PRINT "YOU HAD   $";S;"."
930 PRINT "YOU SPENT $";M;","
940 PRINT "LEAVING   $";S-M;"."
```

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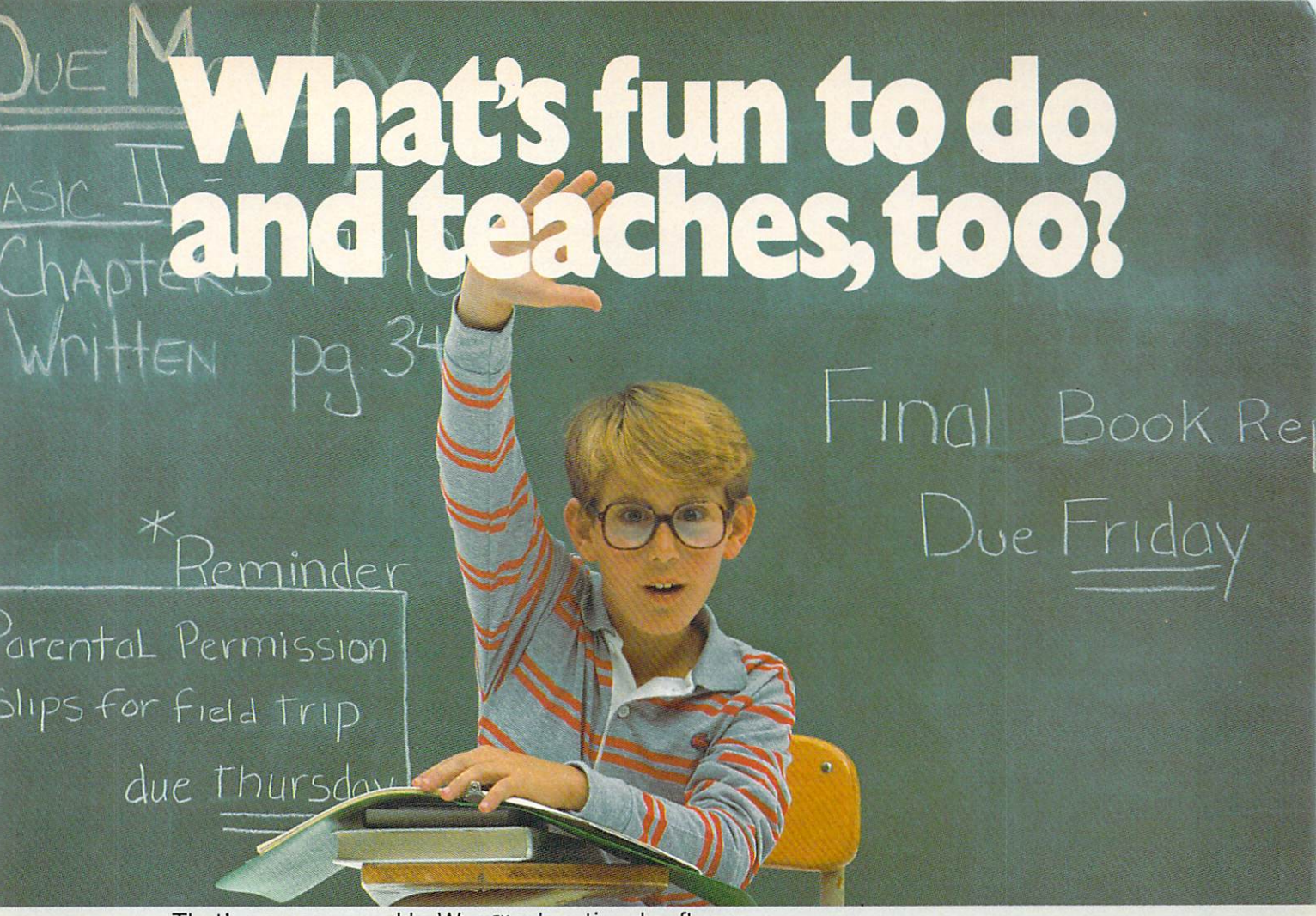

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Commodore 64 & Vic-20/ *Kids' Allowance Planner*

```
20 DIM T$(100),C(100)
40 PRINT CHR$(147)
50 PRINT "PRESS <RETURN>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 PRINT CHR$(147)
110 PRINT "ALL RIGHT ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X=0
340 M=0
350 PRINT CHR$(147)
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $"; S-M
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P+M<=S THEN 650
500 PRINT "SORRY, ";N$
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN 840
540 W=(P-(S-M))/(A+E)
550 IF W=INT(W) THEN 570
560 W=INT(W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEK(S)."
600 PRINT
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$="Y" THEN 330
640 GOTO 850
650 X=X+1
670 T$(X)=B$
680 C(X)=P
690 M=M+P
700 PRINT CHR$(147)
710 PRINT "AFTER BUYING..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "----","----"
750 FOR J=1 TO X
760 IF J/12>INT(J/12) THEN 800
770 PRINT " (PRESS <RETURN> ...)"
780 INPUT R$
790 PRINT CHR$(147)
800 PRINT T$(J),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU'LL HAVE"
840 PRINT "$";S-M;" LEFT."
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN 350
900 IF R$<>"N" THEN 880
910 PRINT
920 PRINT "YOU HAD   $";S;"."
930 PRINT "YOU SPENT $";M;"."
940 PRINT "LEAVING   $";S-M;"."
```

IBM PC & TRS-80 Model 4/ *Kids' Allowance Planner*

```
20 DIM T$(100),C(100)
40 CLS
50 PRINT "PRESS <ENTER>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 CLS
110 PRINT "ALL RIGHT, ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X=0
340 M=0
350 CLS
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S-M;"."
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P+M<=S THEN 650
500 PRINT "SORRY, ";N$;","
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN 850
540 W=(P-(S-M))/(A+E)
550 IF W=INT(W) THEN 570
560 W=INT(W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEK(S)."
600 PRINT
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$="Y" THEN 330
640 GOTO 850
650 X=X+1
670 T$(X)=B$
680 C(X)=P
690 M=M+P
```

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```
700 CLS
710 PRINT "AFTER BUYING ..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "----","----"
750 FOR J=1 TO X
760 IF J/14>INT(J/14) THEN 800
770 PRINT " (PRESS <ENTER> ...)"
780 INPUT R$
790 CLS
800 PRINT T$(J),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU'LL HAVE"
840 PRINT "$";S-M;" LEFT."
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN 350
900 IF R$<>"N" THEN 880
910 PRINT
920 PRINT "YOU HAD   $";S;"."
930 PRINT "YOU SPENT $";M;","
940 PRINT "LEAVING   $";S-M;"."
```

TI-99/4A/*Kids' Allowance Planner*

```
20 DIM T$(100),C(100)
40 CALL CLEAR
50 PRINT "PRESS <ENTER>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 CALL CLEAR
110 PRINT "ALL RIGHT ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X=0
340 M=0
350 CALL CLEAR
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S-M
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P+M<=S THEN 650
500 PRINT "SORRY, ";N$
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN 850
540 W=(P-(S-M))/(A+E)
550 IF W=INT(W)THEN 570
560 W=INT(W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEKS."
600 PRINT
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$="Y" THEN 330
640 GOTO 850
650 X=X+1
670 T$(X)=B$
680 C(X)=P
690 M=M+P
700 CALL CLEAR
710 PRINT "AFTER BUYING ..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "----","----"
750 FOR J=1 TO X
760 IF J/12>INT(J/12)THEN 800
770 PRINT " (PRESS <ENTER> ...)"
780 INPUT R$
790 CALL CLEAR
800 PRINT T$(J),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU'LL HAVE"
840 PRINT "$";S-M;" LEFT"
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN 350
900 IF R$<>"N" THEN 880
910 PRINT
920 PRINT "YOU HAD $";S
930 PRINT "YOU SPENT $";M
940 PRINT "YOU'VE GOT $";S-M
```

Timex Sinclair 1000 w/16K RAM Pack, 1500 & 2068/*Kids' Allowance Planner*

```
 10 FAST
 20 DIM T$(100,15)
 30 DIM C(100)
 40 CLS
 50 PRINT "PRESS <ENTER>"
 60 PRINT "AFTER EACH REPLY."
 70 PRINT
 80 PRINT "WHAT IS YOUR NAME?"
 90 INPUT N$
100 CLS
110 PRINT "ALL RIGHT, ";N$;","
120 PRINT "TIME TO TALK MONEY."
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
180 PRINT "$";
190 INPUT S
200 PRINT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
260 PRINT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU EARN EACH WEEK?"
300 PRINT "$";
310 INPUT E
320 PRINT E
330 LET X=0
340 LET M=0
350 CLS
```

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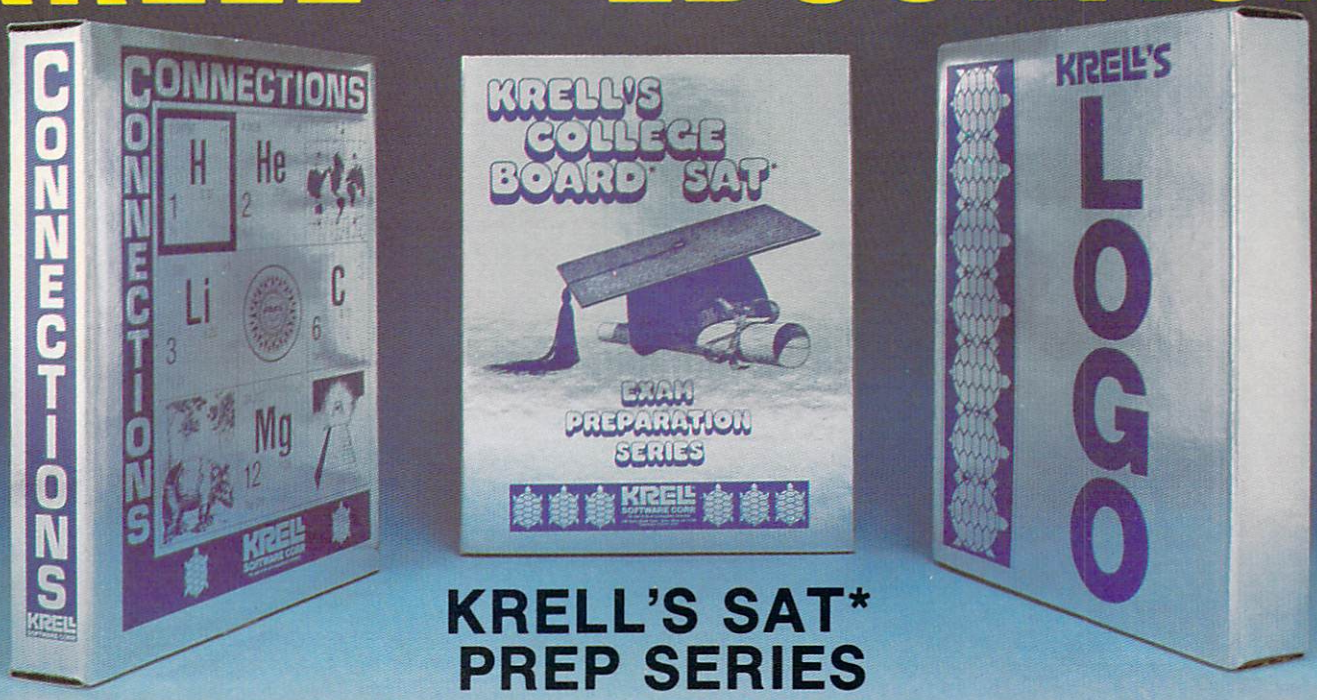

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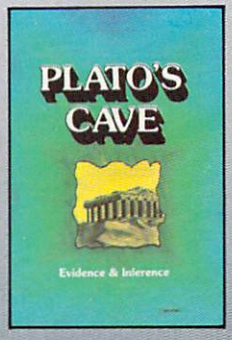

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```
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S-M;"."
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
420 PRINT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT S$;
460 INPUT P
470 PRINT P
480 PRINT
490 IF P+M<=S THEN GOTO 650
500 PRINT "SORRY, ";N$;","
510 PRINT "YOU DO NOT HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN GOTO 850
540 LET W=(P-(S-M))/(A+E)
550 IF W=INT (W) THEN GOTO 570
560 LET W=INT (W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEK(S)."
600 PRINT
610 PRINT "WANT TO START AGAIN?"
620 INPUT R$
630 IF R$="Y" THEN GOTO 330
640 GOTO 850
650 LET X=X+1
660 LET T$(X)=B$
670 LET C(X)=P
680 LET M=M+P
700 CLS
710 PRINT "AFTER BUYING ..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "----","----"
750 FOR J=1 TO X
760 IF J/12>INT (J/12) THEN GOTO 800
770 PRINT " (PRESS <ENTER> ...)"
780 INPUT R$
790 CLS
800 PRINT T$(J),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU WILL HAVE"
840 PRINT "$";S-M;" LEFT."
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN GOTO 350
900 IF R$<>"N" THEN GOTO 880
910 PRINT
920 PRINT "YOU HAD   $";S;"."
930 PRINT "YOU SPENT $";M;","
940 PRINT "LEAVING   $";S-M;"."
```

TRS-80 Color Computer & Models III/*Kids' Allowance Planner*

```
20 DIM T$(100),C(100)
40 CLS
50 PRINT "PRESS <ENTER>"
60 PRINT "AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR NAME";
90 INPUT N$
100 CLS
110 PRINT "ALL RIGHT, ";N$;","
120 PRINT "LET'S TALK MONEY!"
130 PRINT
140 PRINT "IN DOLLARS AND CENTS,"
150 PRINT "HOW MUCH MONEY DO YOU"
160 PRINT "HAVE IN YOUR SAVINGS?"
170 PRINT "FOR EXAMPLE, $? 31.50"
180 PRINT "$";
190 INPUT S
210 PRINT
220 PRINT "HOW MUCH ALLOWANCE"
230 PRINT "DO YOU GET EACH WEEK?"
240 PRINT "$";
250 INPUT A
270 PRINT
280 PRINT "HOW MUCH OTHER MONEY"
290 PRINT "DO YOU GET EACH WEEK?"
300 PRINT "$";
310 INPUT E
330 X=0
340 M=0
350 CLS
360 PRINT "O.K., ";N$;","
370 PRINT "YOU HAVE $";S-M;"."
380 PRINT
390 PRINT "WHAT DO YOU WANT"
400 PRINT "TO BUY?"
410 INPUT B$
430 PRINT
440 PRINT "HOW MUCH DOES IT COST?"
450 PRINT "$";
460 INPUT P
480 PRINT
490 IF P+M<=S THEN 650
500 PRINT "SORRY, ";N$;","
510 PRINT "YOU DON'T HAVE ENOUGH"
520 PRINT "MONEY TO BUY THAT."
530 IF A+E<=0 THEN 850
540 W=(P-(S-M))/(A+E)
550 IF W=INT(W) THEN 570
560 W=INT(W)+1
570 PRINT "BUT IF YOU SAVE $";A+E
580 PRINT "EACH WEEK YOU CAN BUY"
590 PRINT "IT IN ";W;" WEEK(S)."
610 PRINT "WANT TO START AGAIN";
620 INPUT R$
630 IF R$="Y" THEN 330
640 GOTO 850
650 X=X+1
670 T$(X)=B$
680 C(X)=P
690 M=M+P
700 CLS
710 PRINT "AFTER BUYING ..."
720 PRINT
730 PRINT "ITEM","COST"
740 PRINT "----","----"
750 FOR J=1 TO X
760 IF J/6>INT(J/6) THEN 800
770 PRINT " (PRESS <ENTER> ...)"
780 INPUT R$
790 CLS
800 PRINT T$(J),C(J)
810 NEXT J
820 PRINT
830 PRINT "YOU'LL HAVE"
840 PRINT "$";S-M;" LEFT."
850 PRINT
860 PRINT "DO YOU WANT TO BUY"
870 PRINT "SOMETHING ELSE? (Y/N)"
880 INPUT R$
890 IF R$="Y" THEN350
900 IF R$<>"N" THEN 880
910 PRINT
920 PRINT "YOU HAD   $";S;"."
930 PRINT "YOU SPEND $";M;","
940 PRINT "LEAVING   $";S-M;"."
```

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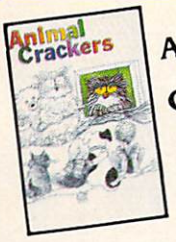

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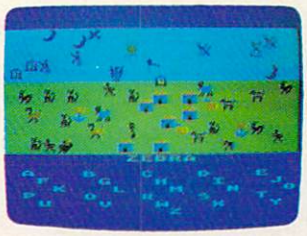

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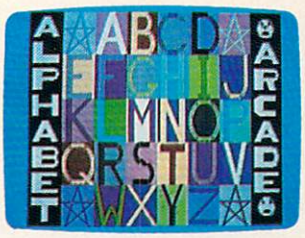

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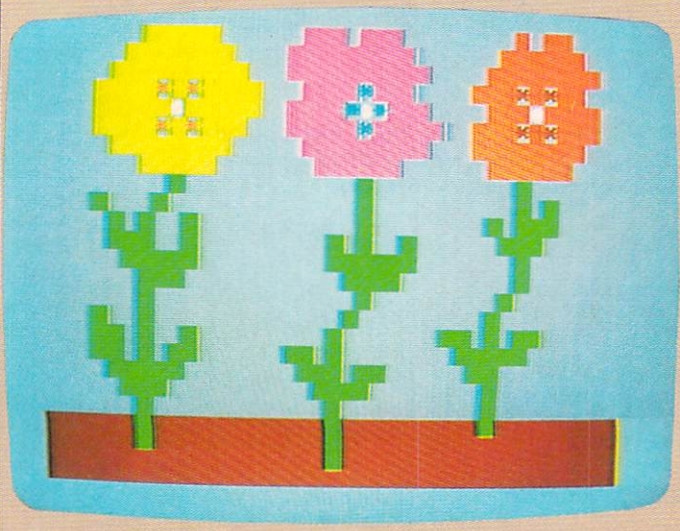
FIRST BLOOM

BY JOEY LATIMER



As the last snow melts, announcing the arrival of spring, it's time to don your rubber boots and set off for a walk in the woods in search of the first budding crocuses. If the nearest woods are 50 miles away, don't despair. There's a green thumb right in your house, in an unexpected place. Discover the *First Blooms* of spring—in your computer!

Apple/*First Bloom*

```
10 HOME:GR:POKE -16302,1
20 DIM F(100),T(100),F2(100),T2(30)
30 FOR X = 1 TO 14:READ F(X),T(X):NEXT X
40 FOR X = 1 TO 14:READ F2(X),T2(X):NEXT X
50 COLOR= 12
60 FOR Y = 40 TO 47:HLIN 0,39 AT Y:NEXT Y
70 FOR X = 6 TO 34 STEP 14
80 OFF = OFF + 1
90 FOR Y = 41 TO 3 STEP - 1
100 PLOT X,Y + OFF
110 NEXT Y
120 NEXT X
130 OFF = 0:C = 1
140 FOR X = 0 TO 28 STEP 14
150 OFF = OFF + 1
160 FOR Y = 27 TO 33
170 HLIN F(C) + X,T(C) + X AT Y + OFF
180 HLIN F(C + 1) + X,T(C + 1) + X AT Y + OFF
190 HLIN F2(C) + X,T2(C) + X AT Y - 12 + OFF
200 HLIN F2(C + 1) + X,T2(C + 1) + X AT Y - 12 + OFF
210 C = C + 2
220 NEXT Y
230 C = 1
240 NEXT X
250 FOR X = 1 TO 16:READ F(X),T(X),F2(X),T2(X):NEXT X
260 FOR Y = 15 TO 0 STEP -1
270 OFF = 0
280 FOR X = 0 TO 26 STEP 13
290 COLOR= 11:IF X = 13 THEN COLOR= 13
300 IF X = 26 THEN COLOR= 3
310 HLIN F(Y + 1) + X,T(Y + 1) + X AT Y + OFF
320 HLIN F2(Y + 1) + X,T2(Y + 1) + X AT Y + OFF
330 NEXT X
340 OFF = OFF + 1
350 NEXT Y
360 FOR X = 1 TO 27 STEP 13
370 COLOR= 8:IF X = 14 THEN COLOR= 2
380 IF X = 27 THEN COLOR= 13
390 PLOT X + 5,3:PLOT X + 5,7
400 PLOT X + 9,3:PLOT X + 9,7
410 PLOT X + 7,5
420 NEXT X
430 GOTO 430
1000 DATA 1,11,11,11,1,2,10,11,1,3,9,11,2,4,8,10,2,4
1010 DATA 8,10,3,5,7,9,4,5,7,8,1,1,6,7,1,3,5,6,1,5
1020 DATA 11,11,2,5,10,11,5,5,9,11,5,6,8,11,6,6,7,11
1030 DATA 5,6,10,12,4,7,9,12,3,7,9,13,3,8,9,13,3,8
1040 DATA 9,13,3,8,9,13,3,8,9,13,4,8,9,12,6,8,9,12
1050 DATA 5,8,9,11,4,8,9,12,4,8,9,13,4,8,9,13,4,8
1060 DATA 9,13,4,8,9,12,4,7,9,1
```

Atari/*First Bloom*

```
10 GRAPHICS 3+16
20 COLOR 2
30 READ CO,RO,N
40 IF CO=-1 THEN 80
50 PLOT CO,RO
60 DRAWTO N,RO
70 GOTO 30
80 READ KO
90 IF KO=-1 THEN 90
100 COLOR KO
110 GOTO 30
1000 DATA 6,22,6,19,22,19,6,21,6,19,21,19,30,21,30
1010 DATA 6,20,6,19,20,19,30,20,30,5,19,7,18,19,21
1020 DATA 30,19,30,4,18,8,17,18,19,21,18,22,29,18,30
1030 DATA 3,17,4,6,17,6,8,17,9,16,17,17,19,17,19
1040 DATA 28,17,32,3,16,4,6,16,6,8,16,9,19,16,19
1050 DATA 27,16,28,30,16,30,32,16,33,3,15,3
1060 DATA 6,15,6,8,15,9,20,15,20,30,15,30,6,14,6
1070 DATA 21,14,21,31,14,31,6,13,8,20,13,23,32,13,32
1080 DATA 5,12,6,8,12,9,19,12,24,32,12,32,4,11,6
1090 DATA 9,11,9,19,11,19,21,11,21,24,11,24,31,11,33
1100 DATA 4,10,4,6,10,6,9,10,9,21,10,21,30,10,30
1110 DATA 32,10,34,3,9,3,7,9,7,21,9,21,32,9,32
1120 DATA 34,9,34,8,8,8,21,8,21,32,8,32,-1,-1,-1,1
1130 DATA 5,7,10,4,6,11,3,5,12,3,4,13,3,3,13,4,2,12
1140 DATA 5,1,11,6,0,10,-1,-1,-1,0,7,4,7,-1,-1,-1,3
1150 DATA 6,3,6,8,3,8,6,5,6,8,5,8
1160 DATA 18,7,23,17,6,25,16,5,26,16,4,25,17,3,24
1170 DATA 16,2,25,16,1,24,17,0,19,21,0,23,-1,-1,-1
1180 DATA 0,21,4,21,-1,-1,-1,1,20,3,20,22,3,22
1190 DATA 20,5,20,22,5,22,30,7,35,29,6,36
1200 DATA 29,5,37,30,4,37,29,3,36,29,2,37,31,1,36
1210 DATA 32,0,32,34,0,36,-1,-1,-1,0,33,4,33
1220 DATA -1,-1,-1,3,32,3,32,34,3,34,32,5,32
1230 DATA 34,5,34,-1,-1,-1,-1
```

Commodore 64/*First Bloom*

```
10 PRINT CHR$(147)
20 POKE 53280,15
30 POKE 53281,15
40 READ B,CH,KO
50 IF B=-1 THEN 50
60 FOR Z=1 TO B
70 READ X,Y
80 FOR P=X TO Y
90 POKE P,CH
100 POKE P+54272,KO
110 NEXT P
120 NEXT Z
130 GOTO 40
1000 DATA 1,160,9,1864,2024,63,160,5,1963,1963,1910
1010 DATA 1910,1923,1923,1870,1870,1883,1883,1894,1894
1020 DATA 1830,1830,1843,1843,1854,1854,1789,1791,1802
1030 DATA 1805,1814,1814,1748,1752,1761,1763,1765,1766
1040 DATA 1773,1774,1707,1708,1710,1710,1712,1713,1720
1050 DATA 1721,1723,1723,1732,1736,1667,1668,1670,1670
1060 DATA 1673,1673,1683,1683,1691,1692,1694,1694,1696
1070 DATA 1697,1627,1627,1630,1630,1644,1644,1654,1654
```

```
1080 DATA 1590,1590,1605,1605,1615,1615,1550,1552,1564
1090 DATA 1567,1576,1576,1509,1510,1511,1513,1523,1528
1100 DATA 1536,1536,1468,1470,1473,1473,1483,1483,1485
1110 DATA 1485,1488,1488,1495,1497,1428,1428,1430,1430
1120 DATA 1433,1433,1445,1445,1454,1454,1456,1458,1387
1130 DATA 1387,1391,1391,1405,1405,1416,1416,1418,1418
1140 DATA 1352,1352,1365,1365,1376,1376,8,160,7,1310
1150 DATA 1314,1268,1275,1227,1236,1187,1197,1147,1157
1160 DATA 1108,1116,1069,1075,1030,1034,1,81,1,1192
1170 DATA 1192,4,42,8,1151,1151,1153,1153,1231,1231
1180 DATA 1233,1233,9,160,4,1322,1327,1281,1289,1240
1190 DATA 1250,1200,1209,1161,1168,1120,1129,1080,1088
1200 DATA 1041,1043,1045,1047,1,81,1,1205,1205,4,42,14
1210 DATA 1165,1165,1204,1204,1245,1245,1206,1206,9
1220 DATA 160,10,1334,1339,1293,1300,1253,1261,1214
1230 DATA 1221,1173,1180,1134,1141,1095,1100,1056,1056
1240 DATA 1058,1059,1,81,1,1217,1217,4,42,2,1176,1176
1250 DATA 1178,1178,1256,1256,1258,1258,-1,-1,-1
```

IBM PC/*First Bloom*

```
10 SCREEN 1
20 KEY OFF
30 CLS
40 COLOR 7,0
50 FOR I=1 TO 4
60 READ X1,Y1,X2,Y2,Z
70 LINE (X1+FL*100,Y1+FL*10)-(X2+FL*100,Y2+FL*10),Z,BF
80 NEXT I
90 FL=FL+1
100 IF FL>2 THEN 130
110 RESTORE 1000
120 GOTO 50
130 FL=0
140 FOR X=1 TO 2
150 READ X1,Y1,X2,Y2
160 FOR I=1 TO 5
170 LINE (X1+FL*100,Y1+FL*10-I)-(X2+FL*100,Y2+FL*10-I)
180 NEXT I
190 FL=FL+1
200 IF FL<3 THEN 160
210 FL=0
220 NEXT X
230 T1=5
240 T2=10
250 FOR X=RND*5 TO RND*20+50 STEP 4
260 FOR Y=RND*5 TO RND*20+15 STEP 4
270 X1=T1+X
280 Y1=T2+Y
290 S=INT(RND*4)+1
300 LINE(X1,Y1)-(X1+S,Y1+S),,BF
310 NEXT Y
320 NEXT X
330 T1=T1+100
340 T2=T2+10
350 IF T1<241 THEN 250
360 R=3
370 C=3
380 LOCATE R,C
390 PRINT CHR$(1)
400 LOCATE R+2,C
410 PRINT CHR$(1)
420 LOCATE R+2,C+2
430 PRINT CHR$(1)
440 LOCATE R,C+2
450 PRINT CHR$(1)
460 R=R+1
470 C=C+13
480 IF R<6 THEN 380
490 LOCATE 1,15
500 PRINT "SPRINGING UP"
510 GOTO 510
1000 DATA 0,160,320,200,1,24,128,40,160,3
1010 DATA 28,100,36,128,1,32,10,35,128,1
1020 DATA 35,80,50,30,32,70,10,12
```

TI-99/4A/*First Bloom*

```
10 CALL CLEAR
20 CALL SCREEN(5)
30 F$="FFFFFFFFFFFFFFFF"
40 FOR X=1 TO 5
50 READ C
60 CALL CHAR(C,F$)
70 NEXT X
80 FOR X=1 TO 7
90 READ CS,F,B
100 CALL COLOR(CS,F,B)
110 NEXT X
120 FOR RO=21 TO 24
130 CALL HCHAR(RO,1,96,31)
140 NEXT RO
150 READ RO,CO
160 IF RO=-1 THEN 190
170 CALL HCHAR(RO,CO,104)
180 GOTO 150
190 READ RO,CO,CH,REP
200 IF CH=-1 THEN 200
210 CALL HCHAR(RO,CO,CH,REP)
220 GOTO 190
1000 DATA 96,104,112,120,128,2,16,4,3,2,8,9,11,11,10,3
1010 DATA 3,11,7,7,12,12,12,13,14,14,23,14,22,4,22,14
1020 DATA 22,26,21,4,21,14,21,26,20,4,20,14,20,26,19,4
1030 DATA 19,13,19,14,19,15,19,16,19,26,18,3,18,4,18,5
1040 DATA 18,6,18,12,18,13,18,14,18,16,18,17,18,25,18
1050 DATA 26,17,2,17,3,17,4,17,5,17,6,17,11,17,12,17
1060 DATA 14,17,24,17,25,17,26,17,27,17,28,16,2,16,4
1070 DATA 16,6,16,15,16,23,16,24,16,26,16,28,16,29
1080 DATA 15,2,15,4,15,16,15,26,14,4,14,5,14,6,14,17
1090 DATA 14,27,13,3,13,4,13,6,13,7,13,16,13,17,13,18
1100 DATA 13,19,13,28,13,29,12,2,12,3,12,4,12,7,12,15
1110 DATA 12,16,12,17,12,18,12,19,12,27,12,28,12,29,12
1120 DATA 30,11,2,11,4,11,7,11,15,11,17,11,19,11,26,11
1130 DATA 28,11,30,10,5,10,17,10,28,9,6,-1,-1
1140 DATA 9,15,120,4,9,26,128,4,8,4,112,5,8,14,120,7,8
1150 DATA 25,128,6,7,3,112,7,7,13,120,9,7,25,128,7,6,2
1160 DATA 112,9,6,5,42,1,6,7,42,1,6,13,120,9,6,16,42,1
1170 DATA 6,18,42,1,6,24,128,8,6,27,42,1,6,29,42,1,5,2
1180 DATA 112,9,5,6,48,1,5,14,120,7,5,17,48,1,5,24,128
1190 DATA 8,5,28,48,1,4,2,112,9,4,5,42,1,4,7,42,1,4,13
1200 DATA 120,9,4,16,42,1,4,18,42,1,4,24,128,8,4,27,42
1210 DATA 1,4,29,42,1,3,3,112,7,3,14,120,8,3,25,128,7
1220 DATA 2,4,112,5,2,15,120,6,2,25,128,6,1,5,112,3,1
1230 DATA 16,120,4,1,26,128,4,-1,-1,-1,-1
```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/*First Bloom*

```
10 FAST
20 DIM D$(22,32)
30 LET D$(1)="...PIIIIID....PIII.IID..PI.IIIID"
40 LET D$(2)="..PI.....ID...I...I.II..I.I....I"
50 LET D$(3)="..I..B.B..I...I.P.P..I..I..D.DI."
60 LET D$(4)="..I...B...I....I.P..I...I...D..I"
70 LET D$(5)="..I..B.B..I...I.P.P..I...I.D.D.I"
80 LET D$(6)="..BII.....I...BI.....I..I.....IA"
90 LET D$(7)="....BIIIIIA....BIIIIIA..BIIIIIA."
100 LET D$(8)="...E..E..........N........N...."
110 LET D$(9)="...EPGA..........PJ........N.E.."
120 LET D$(10)="..CCM..N.......LDN..E....N.NCA.."
130 LET D$(11)="....CMCC.........CCGCA....CCM...."
140 LET D$(12)=".....N...........LGC.......N...."
150 LET D$(13)="..N..N............E.......PJ...."
160 LET D$(14)="..NE.N.E.........PGA.......N....."
170 LET D$(15)="..NE.N.E.........N.........N.GC.."
180 LET D$(16)="...CENGA....CCM.N........CMNCA..."
190 LET D$(17)="....CME.......BMN.PL.....BM....."
200 LET D$(18)=".....N.........BMCC.......N....."
210 LET D$(19)=".....N..........N.........N....."
220 LET D$(20)=D$(19)
230 LET D$(21)=D$(20)
240 LET D$(22)="................N..............."
```

→

```
250 CLS
260 FOR X=0 TO 31
270 PRINT AT 19,X;CHR$ 136
280 NEXT X
290 SLOW
300 FOR X=22 TO 1 STEP -1
310 FOR Y=1 TO 32
320 LET Z=CODE D$(X,Y)-37
330 IF Z=-10 THEN GOTO 360
340 IF Z>8 THEN LET Z=Z+119
350 PRINT AT X-1,Y-1;CHR$ Z
360 NEXT Y
370 NEXT X
380 GOTO 330
```

TRS-80 Color Computer/*First Bloom*

```
10 CLS(0)
20 READ Z
30 IF Z=-1 THEN 60
40 PRINT@Z,CHR$(143);
50 GOTO 20
60 READ A,B,CH,CO
70 IF A=-1 THEN 70
80 FOR Z=A TO B
90 PRINT@Z,CHR$(CH+CO);
100 NEXT Z
110 GOTO 60
1000 DATA 454,464,474,422,432,442,388,389,390,400
1010 DATA 401,402,408,409,410,356,358,359,360,368
1020 DATA 370,376,378,379,380,326,328,334,335,336
1030 DATA 346,348,292,293,294,302,304,305,306,312
1040 DATA 313,314,260,262,263,264,272,274,280,282
1050 DATA 230,232,240,250,-1,196,200,143,48,206
1060 DATA 210,143,16,216,221,143,96,163,169,143
1070 DATA 48,173,179,143,16,183,190,143,96,130
1080 DATA 138,143,48,133,133,139,48,135,135,135
1090 DATA 48,140,148,143,16,143,143,139,16,145
1100 DATA 145,135,16,150,158,143,96,153,153,139
1110 DATA 96,155,155,135,96,97,106,143,48,102
1120 DATA 102,143,16,108,116,143,16,112,112
1130 DATA 143,112,118,126,143,96,122,122,143,48
1140 DATA 66,74,143,48,69,69,142,48,71,71,141
1150 DATA 48,76,84,143,16,79,79,142,16,81,81
1160 DATA 141,16,86,94,143,96,89,89,142,96,91
1170 DATA 91,141,96,35,41,143,48,45,51,143,16
1180 DATA 55,61,143,96,5,8,143,48,15,18,143,16
1190 DATA 25,28,143,96,-1,-1,-1,-1,-1
```

TRS-80 Model III/*First Bloom*

```
10 CLS
20 FOR RO=39 TO 47
30 FOR CO=0 TO 127
40 SET (CO,RO)
50 NEXT CO
60 NEXT RO
70 FOR CF=32 TO 96 STEP 32
80 FOR X=38 TO 11 STEP -1
90 SET(CF,X)
100 NEXT X
110 FOR X=CF-10 TO CF+10
120 SET (X,26)
130 F=0
140 IF (X>CF-8 AND X<CF-2) OR (X>CF+2 AND X<CF+8) THEN
 F=1
150 IF F=1 THEN SET (X,25)
160 IF F=1 THEN SET (X,27)
170 NEXT X
180 Y=9
190 FOR X=CF-6 TO CF+6
200 SET (X,15)
210 IF Y>11 AND Y<19 THEN SET (X,Y)
220 IF Y>11 AND Y<19 THEN SET (X,30-Y)
230 Y=Y+1
240 NEXT X
250 NEXT CF
260 PRINT@922,"SPRING FLOWERS";
270 GOTO 270
```

VIC-20/*First Bloom*

```
10 PRINT CHR$(147)
20 POKE 36878,137
30 READ B,CH,KO
40 IF B=-1 THEN 40
50 FOR Z=1 TO B
60 READ X,Y
70 FOR P=X TO Y
80 POKE P,CH
90 POKE P+30720,KO
100 NEXT P
110 NEXT Z
120 GOTO 30
1000 DATA 1,160,6,7680,8097,34,160,5,8158,8158,8125
1010 DATA 8125,8136,8136,8103,8103,8114,8114,8081,8081
1020 DATA 8092,8092,8059,8061,8069,8070,8036,8037,8039
1030 DATA 8039,8046,8050,8013,8015,8023,8024,8026,8026
1040 DATA 8028,8029,7991,7991,7993,7993,8004,8004,7971
1050 DATA 7972,7971,7972,7982,7982,7949,7951,7960,7962
1060 DATA 7926,7927,7929,7929,7937,7938,7940,7949,7903
1070 DATA 7905,7914,7914,7916,7916,7881,7881,7883,7883
1080 DATA 7894,7894,9,160,4,7860,7862,7837,7841,7814
1090 DATA 7820,7791,7799,7769,7777,7747,7755,7725,7732
1100 DATA 7704,7709,7683,7686,1,81,0,7773,7773,4,42,1
1110 DATA 7794,7794,7796,7796,7750,7750,7752,7752,9
1120 DATA 160,7,7870,7873,7847,7852,7824,7831,7802
1130 DATA 7810,7780,7788,7758,7766,7737,7744,7715,7721
1140 DATA 7694,7698,1,81,0,7784,7784,4,42,1,7761,7761
1150 DATA 7763,7763,7805,7805,7807,7807,-1,-1,-1
```

CORRECTIONS

In the Timex version of *Ski Trek* (February issue, p. 102), there is a misprint in line 130. The line should read as follows:

130 PRINT TAB(10); "THE SKI GAME"

Also, line 590 in the Timex version of *Decision Maker* (January issue, p. 120) is incorrect. The line should read as follows:

590 IF R(C)<1 OR R(C)>10 THEN GOTO 580

We regret these errors.

SOLUTION TO LAST MONTH'S PUZZLE:

These choices are most in keeping with Kurt and Dede's character, though you may act differently in a similar situation! **Level I:** *8 (can drive her home), 25 (demonstrates popularity with boys but leaves ride home open);* **Level II:** *23 (James Dean fan), 42 (Valentine's Day colors);* **Level III:** *43 (best view), 38 (flirtatious);* **Level IV:** *54 (stirs up notice), 44 (flirtatious);* **Level V:** *12 (romantic song is perfect moment), 45 (self-assuredly returns interest);* **Level VI:** *4 (gets them alone), 20 (strict parents);* **Level VII:** *19 (keeps them alone in uncommitted way), 3 (smoothly encourages Kurt);* **Level VIII:** *2 (finds out if free without risking rejection), 15 (isn't seeing him);* **Level IX:** *48, 17*

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GHOSTS IN THE NIGHT

PUZZLE BY STEPHEN SHORB
PROGRAM BY PETER COCKCROFT

You've had a hard time sleeping ever since you moved into the old Calthrop Manor on the north side of town. It's strange, but when the clock strikes midnight, you get the uneasy feeling that the manor comes to life with people of a bygone era. Even more peculiar is that many of the events you've witnessed during your insomniac wanderings through the manor seem to match those narrated in an old diary you recently found on the grounds.

Old timers in town have told you that the Calthrops were prominent members of Sodaville, U.S.A., society a century ago, and that they had two beautiful daughters who were courted by many suitors. The diary you've found belongs to one of their daughters, named Vanessa. It mentions a mysterious suitor referred to only as "S." Curious about their love affair, you get up one night and go into the ballroom, where the diary begins, in an effort to follow the ghost of Vanessa.

When you run *Mystery Manor*, the computer will tell you the actions, dates, and names of the ghosts in each room. To move from room to room, type in the room number (digits only) as it appears on the accompanying floor plan. You can move from one room to another only if they're connected by a doorway.

To retrace Vanessa's steps, use the diary as a key. Find the room that exactly matches each day's entry. No two entries refer to the same room. Each time you enter a room counts as a move. After 10 moves, the computer will inform you whether or not you have accurately retraced Vanessa's steps. To begin again, type the number "0," press the RETURN or ENTER key, and you will find yourself back in the ballroom.

The last page in the diary has been ripped out. It is up to you to figure out Vanessa Calthrop's whereabouts on that day, and in so doing, discover the true identity of "S" and whether Vanessa followed him to a happy or a tragic ending.

January 2, 1884—Today was my debut into society. One of my suitors, Sidney, is a rancher and is quite romantic in spite of his years. He said, "I would only court a young woman in the lap of nature under the magnolias, at the first blooming of spring." (My!) I countered that an old family tradition mandates that all Calthrop women must receive their very first suitor in the most formal room of the mansion. Mother interjected that our family doesn't follow the standard etiquette in one respect: After all, we have breakfast in the parlor!

Sebastian, another suitor, is a visiting English cavalry officer, who said he would rather meet his destiny in a rose garden than in a battlefield. Septimus, a third suitor, is a big game hunter with a scholarly streak, who brought me a book of poetry to add to our library, which he admires so much.

Dearest sister, Amanda, whispered that she'd gladly dismiss all her suitors for just one of mine. Fortunately, Aunt Emily, who always acts as chaperone when gentlemen come to call on me, was sick in bed and could not overhear that remark! Who will be the first to call on me?

February 2, 1884—Tea with my first gentleman caller, Sebastian. Father invited him to the smoking room, then to see the gun room (two exclusively male domains in the manor), but Sebastian declined in order to be with me. We sat on an uncomfortably stiff, velvet settee. Sebastian is as bright and impressive as the medals on his uniform. Even Aunt Emily was sorry to see him depart, but not as sorry as I.

March 21, 1884—Today a new season arrived, and with it a new suitor: Sidney. Aunt Emily nearly choked when he compared the magnolia blossoms around us to the "soft pink" of my cheeks. I fear my pink would fade if he were not to call again.

April 12, 1884—Spent the day with my third suitor, Septimus, in his favorite spot at the manor. At first he was quite distracted, his nose buried in his surroundings. He did compliment my brown eyes, explaining he dislikes blue "ever since the Union bluecoats burned my house during the Civil War." Aunt Emily was taken aback by his sudden change of mood, but I found it rather exciting.

August 2, 1884—Breakfast began with Aunt Emily's account to my mother of every word my suitors said. Thank heavens Amanda was not there to become jealous—Amanda refuses to be in the same room as Aunt Emily, since they always quarrel. Little does Mother know I have already chosen the one suitor to whom I would give my heart and soul. (For caution's sake, I refer to him only as S hereafter.) My heart leapt when in the morning mail I discovered an invitation to me from S for a secret nighttime meeting. Oh, joy!

September 30, 1884—Oh, misery! My reply to S was read by my sister before I sent it off! When I refused to tell her who S was, she flung my hairbrush at me and nearly broke my mirror. She cried, "I must know . . . for I love him as much as you!" When I asked her to which S she referred, she, too, was silent.

October 12, 1884—My meeting with S was aborted! I arrived at our appointed place only to discover Amanda there instead! She explained that she came to discover S's identity, but her plan obviously backfired, because her presence frightened him away. Our discussion added more heat to the already hot environment.

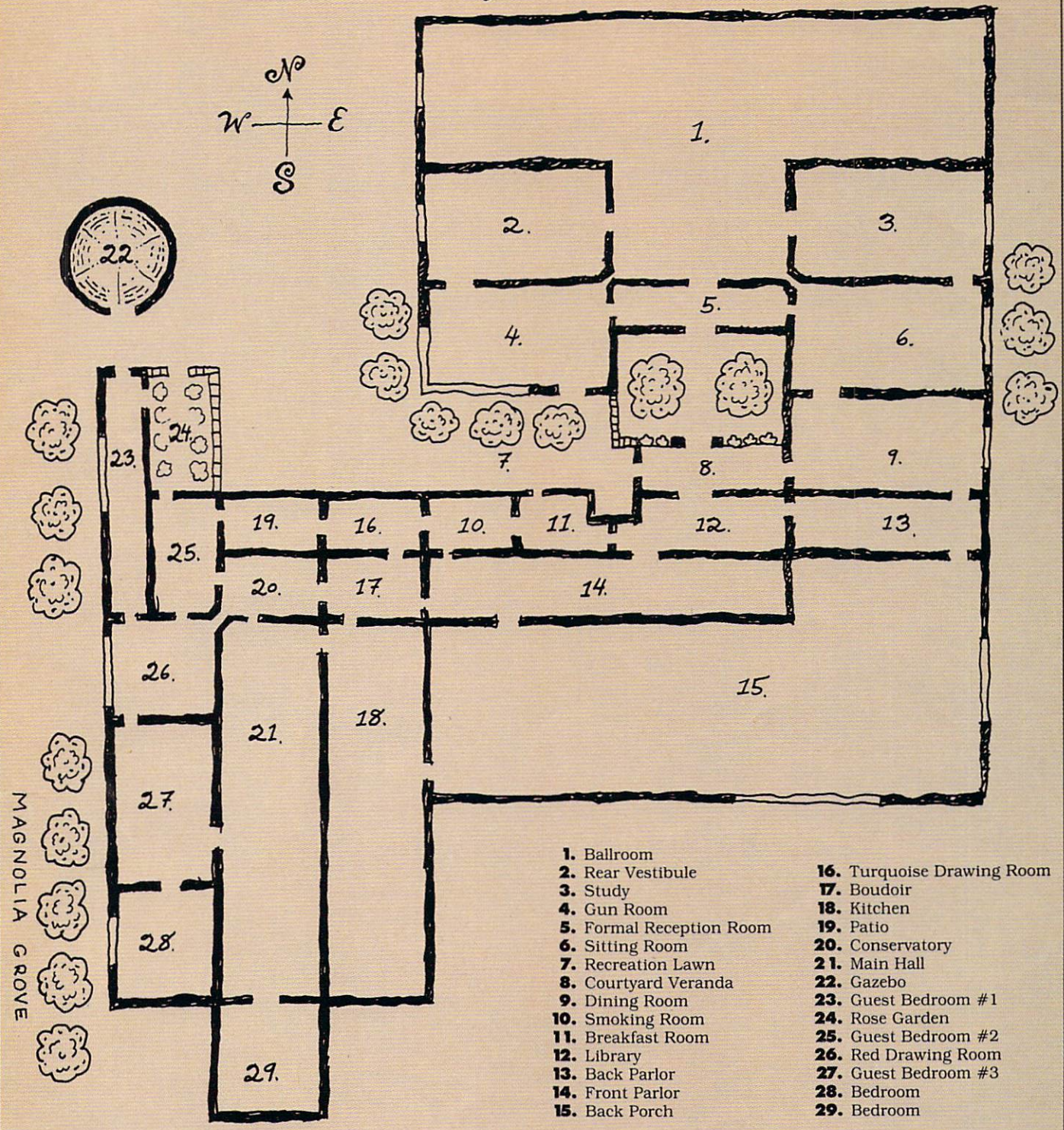
November 23, 1884—From the holiday buffet table, Septimus, Sebastian, Sidney, and the family (save for Aunt Emily who was abed with dropsy) watched the last radiance of the setting sun dip below the snow drifts. S's at-

---

STEPHEN SHORB *is not the mysterious suitor named 'S,' but he wishes he were a Victorian squire, and has crowded his manor (a one-bedroom apartment in San Francisco) with Victorian artifacts including a statue of Disraeli. He graduated Phi Beta Kappa from the University of California at Berkeley with a degree in Victorian Literature.*

PETER COCKCROFT *attends Stuyvesant High School in New York City and is president of his own mail-order software business. He is the author of last month's Reader-Written program.*

Calthrop Manor



1. Ballroom
2. Rear Vestibule
3. Study
4. Gun Room
5. Formal Reception Room
6. Sitting Room
7. Recreation Lawn
8. Courtyard Veranda
9. Dining Room
10. Smoking Room
11. Breakfast Room
12. Library
13. Back Parlor
14. Front Parlor
15. Back Porch
16. Turquoise Drawing Room
17. Boudoir
18. Kitchen
19. Patio
20. Conservatory
21. Main Hall
22. Gazebo
23. Guest Bedroom #1
24. Rose Garden
25. Guest Bedroom #2
26. Red Drawing Room
27. Guest Bedroom #3
28. Bedroom
29. Bedroom

titude towards me was very cold. Is he bitter over what happened in October? He must know I did not wish Amanda to interrupt our tryst. To make matters worse, I noticed Amanda was in unusually buoyant spirits. After S retired to his bedroom next door, I pondered over whether I had lost him forever.

November 24, 1884— The three S's spent the day packing, and vacated their bed chambers by evening. Not long after, a servant noticed that Amanda and her belongings had vanished. Mother has collapsed in a faint. Amanda has clearly run off with one of my three beaus. If it should be my S I think I shall suffer worse than a fainting spell. I now find myself writing this in S's empty room. The clock on the mantel will soon strike midnight. The magnolia branches are scraping against the window as a new sleet storm wages outside. I have just found an envelope addressed to me from S. My hand shakes as I prepare to open it. But no matter what it says, I will follow him.

ILLUSTRATION BY JOSH GOSFIELD

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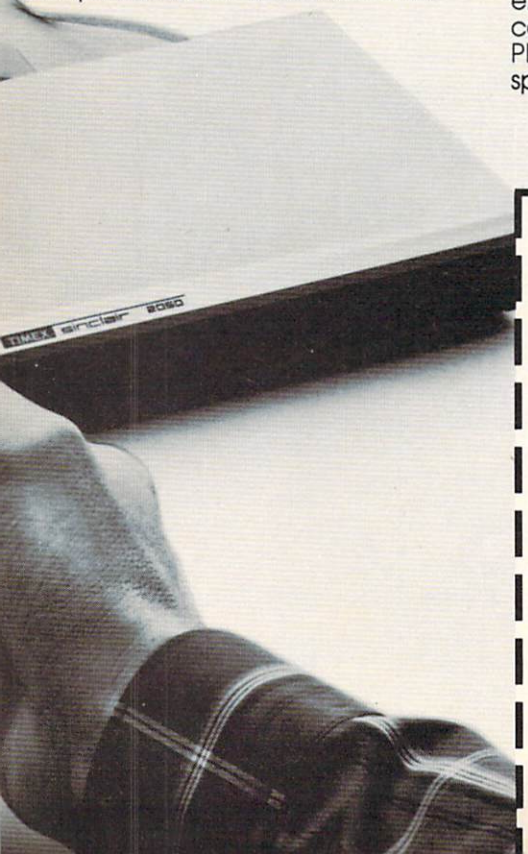

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TIMEX sinclair 2068

Base Version (TRS-80 Models III & 4)/ *Mystery Manor*

```
10 CLEAR 2000:DIM ROOM$(29,2),ADJ$(29),DTE$(11),GU(12)
,PEOPLE$(9),ACT$(18),G(12)
80 FOR I=1 TO 29:READ ROOM$(I,0),ROOM$(I,1),ROOM$(I,2)
:NEXT I
90 FOR I=1 TO 29:READ ADJ$(I):NEXT I
100 FOR I=1 TO 11:READ DTE$(I),GU(I):NEXT I
110 FOR I=1 TO 9:READ PEOPLE$(I):NEXT I
120 FOR I=1 TO 18:READ ACT$(I):NEXT I
130 G(1)=1:R=1:C=1:FLAG=0
140 CLS
150 N$="You're in Location #"+STR$(R):GOSUB 2000 :N$="
Date: "+DTE$(VAL(ROOM$(R,0)))+", 1884":GOSUB 2000
170 PRINT "Ghosts present:":FOR I=1 TO LEN(ROOM$(R,1))
:PRINT I;"- ";PEOPLE$(VAL(MID$(ROOM$(R,1),I,1))):NEXT
I
190 PRINT "Action taking place:":N$ = "  "+ACT$(VAL(RO
OM$(R,2))):GOSUB 2000
200 IF C=10 THEN 300
210 N$="Which location comes next (0 restarts)":GOSUB
2000 :INPUT NR
220 IF NR=0 THEN 130
230 IF NR=R OR NR>29 THEN 140
240 FOR I=1 TO C:IF NR=G(I) THEN N$="You've already be
en there!":GOSUB 2000 :GOTO 210
250 NEXT I:LE=0
260 FOR I=1 TO LEN(ADJ$(R)):IF NR=VAL(MID$(ADJ$(R),I*2
-1,2)) THEN LE=1
270 NEXT I
280 IF LE=0 THEN N$="You can't get there from here!":G
OSUB 2000 :GOTO 210
290 C=C+1:G(C)=NR:R=NR:GOTO 140
300 N$="You've made ten moves. Press any key to contin
ue.":GOSUB 2000
310 K$=INKEY$:IF K$="" THEN 310
320 CLS:PRINT "Your sequence was:":PRINT
330 FOR I=1 TO 10:PRINT G(I);:FLAG=FLAG+(G(I)<>INT(SQR
(GU(I)-10))):NEXT I:PRINT
340 IF FLAG<>0 THEN G$="Sorry! ":NO$="not "
350 IF FLAG=0 THEN G$="Congratulations! ":NO$=""
360 PRINT:N$=G$+"You have "+NO$+"followed Vanessa's st
eps.":GOSUB 2000
370 IF NO$="" THEN END
380 FOR DELAY=1 TO 3000:NEXT DELAY:GOTO 130
2000 IF LEN(N$)<64 THEN PRINT N$:RETURN
2010 FOR I=1 TO 64:IF ASC(MID$(N$,I,1))=32 THEN J=I-1
2020 NEXT I:PRINT LEFT$(N$,J):N$=RIGHT$(N$,LEN(N$)-J-1
):GOTO 2000
3000 DATA 1,1234678,2,2,18,1,11,185,1,3
3010 DATA 165,1,2,185,1,3,16,1,4,175,3
3020 DATA 3,156,1,4,185,1,6,14,4,5,152
3030 DATA 5,4,157,1,5,154,5,5,152,5,6
3040 DATA 154,4,7,147,6,6,14,4,7,13,7
3050 DATA 8,1234678,8,7,14,6,8,1234678
3060 DATA 9,10,16,10,9,1,11,10,48,12,9
3070 DATA 1,13,8,1234678,14,9,1,15,10,5,17,9,9,18
4000 DATA 0203040506,0104,0106,01020507,01040608
4010 DATA 01030509,040811222324,05070912,060813
4020 DATA 161114,071012,08111314,091215
4030 DATA 10121517,131418,191710,14161820
4040 DATA 151721,2516,25172126,18202729
4050 DATA 232407,22242607,23252207,24192026,23252027
4060 DATA 262128,27,21
5000 DATA January 2,11,February 2,35,March 21,74
5010 DATA April 12,154,August 2,206,September 30,299
5020 DATA October 12,410,November 23,686,November 24,5
39
5030 DATA November 25,494,February 12,794
6000 DATA Vanessa,Mother,Father,Amanda,Aunt Emily,Sidn
ey,Septimus,Sebastian,Nobody
7000 DATA Courtship,Debut party,Ice skating,Jealous qu
arrel
7010 DATA Reads invitation,Secret meeting,Frozen pie f
ight
7020 DATA Hula-hoop contest,Brunch party,Lovers united
!
7030 DATA Finds note - "If you love me -- meet me righ
t outside."
7040 DATA Eloping on horse,Finds two movie tickets,Tur
key feast
7050 DATA Finds two plane tickets,Construction,Snoring
,Nothing
```

Atari/*Mystery Manor*

```
10 DIM ROOM(29,2),ADJ$(200),DTE$(200),GU(12),PEOPLE$(2
00),ACT$(300),G(13),IDTE(13),IPEP(10),IACT(19),N$(100)
20 DIM T$(15),IADJ(30),NO$(10):OPEN #1,4,0,"K:":SETCOL
OR 2,10,4:SETCOLOR 4,10,8
80 FOR I=1 TO 29:READ X,Y,Z:ROOM(I,0)=X:ROOM(I,1)=Y:RO
OM(I,2)=Z:NEXT I
90 FOR I=1 TO 29:READ N$:Y=LEN(ADJ$)+1:IADJ(I)=Y:ADJ$(
Y)=N$:NEXT I:IADJ(I)=LEN(ADJ$)+1
100 FOR I=1 TO 11:READ N$:Y=LEN(DTE$)+1:IDTE(I)=Y:DTE$
(Y)=N$:READ Z:GU(I)=Z:NEXT I:IDTE(I)=LEN(DTE$)+1
110 FOR I=1 TO 9:READ N$:Y=LEN(PEOPLE$)+1:IPEP(I)=Y:PE
OPLE$(Y)=N$:NEXT I:IPEP(I)=LEN(PEOPLE$)+1
120 FOR I=1 TO 18:READ N$:Y=LEN(ACT$)+1:IACT(I)=Y:ACT$
(Y)=N$:NEXT I:IACT(I)=LEN(ACT$)+1
130 G(1)=1:R=1:C=1:FLAG=0
140 PRINT CHR$(125):POKE 82,0
150 N$="You're in Location #":GOSUB 1000:N$(L)=STR$(R)
:GOSUB 2000:N$="Date:":GOSUB 1000
160 F=IDTE(ROOM(R,0)):T=IDTE(ROOM(R,0)+1)-1:N$(L+1)=DT
E$(F,T):GOSUB 1000:N$(L+1)=", 1884":GOSUB 2000
170 PRINT "Ghosts present:":PRINT :FOR I=1 TO LEN(STR$
(ROOM(R,1))):PRINT " ";I;"- ";:N$=STR$(ROOM(R,1))
180 T=VAL(N$(I,I)):PRINT PEOPLE$(IPEP(T),IPEP(T+1)-1):
NEXT I:PRINT
190 PRINT "Action taking place: ":F=IACT(ROOM(R,2)):T=
IACT(ROOM(R,2)+1)-1:N$=ACT$(F,T):PRINT "  ";:GOSUB 200
0
200 IF C=10 THEN 300
210 POSITION 0,18:PRINT CHR$(156);"Which location come
s next? (0 restarts)":TRAP 210:INPUT NR
220 IF NR=0 THEN 130
230 IF NR=R OR NR>29 THEN 140
240 FOR I=1 TO C:IF NR=G(I) THEN N$="You've already be
en there!":GOSUB 2100:GOTO 210
250 NEXT I:LE=0
260 N$=ADJ$(IADJ(R),IADJ(R+1)-1):GOSUB 1000:FOR I=1 TO
 L/2:T=VAL(N$(I*2-1,I*2)):IF NR=T THEN LE=1
270 NEXT I
280 IF LE=0 THEN N$="You can't get there from here!":G
OSUB 2100:GOTO 210
290 C=C+1:G(C)=NR:R=NR:GOTO 140
300 N$="You've made ten moves. Press any key to contin
ue.":GOSUB 2100
310 GET #1,I
320 PRINT CHR$(125);"Your sequence was:":PRINT
330 FOR I=1 TO 10:PRINT G(I):FLAG=FLAG+(G(I)<>SQR(GU(I
)-10)):NEXT I:PRINT
340 IF FLAG<>0 THEN N$="Sorry! ":NO$="not"
350 IF FLAG=0 THEN N$="Congratulations!  ":NO$="":SETC
OLOR 4,0,14:PRINT CHR$(253);
360 PRINT :GOSUB 1000:N$(L+1)="You have ":GOSUB 1000:N
$(L+1)=NO$:GOSUB 1000:N$(L+1)=" followed Vanessa's ste
ps."
370 GOSUB 2000:IF NO$="" THEN END
380 FOR DELAY=1 TO 3000:NEXT DELAY:GOTO 130
1000 L=LEN(N$):RETURN
2000 IF LEN(N$)<40 THEN PRINT N$:PRINT :RETURN
2010 FOR Z=1 TO 40:IF N$(Z,Z)=" " THEN J=Z
2020 NEXT Z:PRINT N$(1,J):N$=N$(J+1):GOTO 2000
2100 POSITION 0,21:PRINT CHR$(253);N$:FOR DELAY=1 TO 6
00:NEXT DELAY:POSITION 0,21:PRINT CHR$(156):RETURN
```

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```
3000 DATA 1,1234678,2,2,18,1,11,185,1,3
3010 DATA 165,1,2,185,1,3,16,1,4,175,3
3020 DATA 3,156,1,4,185,1,6,14,4,5,152
3030 DATA 5,4,157,1,5,154,5,5,152,5,6
3040 DATA 154,4,7,147,6,6,14,4,7,13,7
3050 DATA 8,1234678,8,7,14,6,8,1234678
3060 DATA 9,10,16,10,9,1,11,10,48,12,9
3070 DATA 1,13,8,1234678,14,9,1,15,10,5,17,9,9,18
4000 DATA 0203040506,0104,0106,01020507,01040608
4010 DATA 01030509,040811222324,05070912,060813
4020 DATA 161114,071012,08111314,091215
4030 DATA 10121517,131418,191710,14161820
4040 DATA 151721,2516,25172126,18202729
4050 DATA 232407,22242607,23252207,24192026,23252027
4060 DATA 262128,27,21
5000 DATA January 2,11,February 2,35,March 21,74
5010 DATA April 12,154,August 2,206,September 30,299
5020 DATA October 12,410,November 23,686,November 24,5
39
5030 DATA November 25,494,February 12,794
6000 DATA Vanessa,Mother,Father,Amanda,Aunt Emily,Sidn
ey,Septimus,Sebastian,Nobody
7000 DATA Courtship,Debut party,Ice skating,Jealous Qu
arrel
7010 DATA Reads invitation,Secret meeting,Frozen pie f
ight
7020 DATA Hula-hoop contest,Brunch party,Lovers united
!
7030 DATA Finds note: "If you love me meet me right ou
tside."
7040 DATA Eloping on horse,Finds two moving tickets,Tu
rkey feast
7050 DATA Finds two plane tickets,Construction,Snoring
,Nothing
```

Commodore 64/*Mystery Manor*

```
10 DIM ROOM$(29,2),ADJ$(29),DTE$(11),GU(12),PEOPLE$(9)
,ACT$(18),G(12)
80 FOR I=1 TO 29:READ ROOM$(I,0),ROOM$(I,1),ROOM$(I,2)
:NEXT I
90 FOR I=1 TO 29:READ ADJ$(I):NEXT I
100 FOR I=1 TO 11:READ DTE$(I),GU(I):NEXT I
110 FOR I=1 TO 9:READ PEOPLE$(I):NEXT I
120 FOR I=1 TO 18:READ ACT$(I):NEXT I
130 G(1)=1:R=1:C=1:FLAG=0
140 PRINT CHR$(147)
150 N$="YOU'RE IN LOCATION #"+STR$(R):GOSUB 2000
160 N$="DATE: "+DTE$(VAL(ROOM$(R,0)))+", 1884":GOSUB 2
000
170 PRINT "GHOSTS PRESENT:":FOR I=1 TO LEN(ROOM$(R,1))
180 PRINT I;"- ";PEOPLE$(VAL(MID$(ROOM$(R,1),I,1))):NE
XT I
190 PRINT "ACTION TAKING PLACE:":N$ = "  "+ACT$(VAL(RO
OM$(R,2))):GOSUB 2000
200 IF C=10 THEN 300
210 N$="WHICH LOCATION COMES NEXT (0 RESTARTS)":GOSUB
2000:INPUT NR
220 IF NR=0 THEN 130
230 IF NR=R OR NR>29 THEN 140
240 FOR I=1 TO C:IF NR=G(I) THEN PRINT "YOU'VE BEEN TH
ERE!":GOTO 210
250 NEXT I:LE=0
260 FOR I=1 TO LEN(ADJ$(R)):IF NR=VAL(MID$(ADJ$(R),I*2
-1,2)) THEN LE=1
270 NEXT I
280 IF LE=0 THEN N$="YOU CAN'T GET THERE FROM HERE!":G
OSUB 2000:GOTO 210
290 C=C+1:G(C)=NR:R=NR:GOTO 140
300 N$="YOU'VE MADE TEN MOVES. PRESS ANY KEY TO CONTIN
UE.":GOSUB 2000
310 GET K$:IF K$="" THEN 310
320 PRINT CHR$(147):PRINT "YOUR SEQUENCE WAS:":PRINT
330 FOR I=1 TO 10:PRINT G(I);:FLAG=FLAG+(G(I)<>INT(SQR
(GU(I)-10))):NEXT I:PRINT
340 IF FLAG<>0 THEN G$="SORRY! ":NO$="NOT "
350 IF FLAG=0 THEN G$="CONGRATULATIONS! ":NO$=""
360 PRINT:N$=G$+"YOU HAVE "+NO$+"FOLLOWED VANESSA'S ST
EPS.":GOSUB 2000
370 IF NO$="" THEN END
380 FOR DELAY=1 TO 3000:NEXT DELAY:GOTO 130
2000 IF LEN(N$)<40 THEN PRINT N$:RETURN
2010 FOR I=1 TO 40:IF ASC(MID$(N$,I,1))=32 THEN J=I-1
2020 NEXT I:PRINT LEFT$(N$,J):N$=RIGHT$(N$,LEN(N$)-J-1
):GOTO 2000
```

```
3000 DATA 1,1234678,2,2,18,1,11,185,1,3
3010 DATA 165,1,2,185,1,3,16,1,4,175,3
3020 DATA 3,156,1,4,185,1,6,14,4,5,152
3030 DATA 5,4,157,1,5,154,5,5,152,5,6
3040 DATA 154,4,7,147,6,6,14,4,7,13,7
3050 DATA 8,1234678,8,7,14,6,8,1234678
3060 DATA 9,10,16,10,9,1,11,10,48,12,9
3070 DATA 1,13,8,1234678,14,9,1,15,10,5,17,9,9,18
4000 DATA 0203040506,0104,0106,01020507,01040608
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5020 DATA OCTOBER 12,410,NOVEMBER 23,686,NOVEMBER 24,5
39
5030 DATA NOVEMBER 25,494,FEBRUARY 12,794
6000 DATA VANESSA,MOTHER,FATHER,AMANDA,AUNT EMILY,SIDN
EY,SEPTIMUS,SEBASTION
6010 DATA NOBODY
7000 DATA COURTSHIP,DEBUT PARTY,ICE SKATING,JEALOUS QU
ARREL
7010 DATA READS INVITATION,SECRET MEETING,FROZEN PIE F
IGHT
7020 DATA HULA-HOOP CONTEST,BRUNCH PARTY,LOVERS UNITED
!
7030 DATA FINDS NOTE - "IF YOU LOVE ME -- MEET ME RIGH
T OUTSIDE."
7040 DATA ELOPING ON HORSE,FINDS TWO MOVIE TICKETS,TUR
KEY FEAST
7050 DATA FINDS TWO PLANE TICKETS,CONSTRUCTION,SNORING
,NOTHING
```

TI-99/4A w/TI Extended BASIC/*Mystery Manor*

```
10 DIM ROOM$(29,2),ADJ$(29),DTE$(11),GU(12),PEOPLE$(9)
,ACT$(18),G(12)
80 FOR I=1 TO 29 :: READ ROOM$(I,0),ROOM$(I,1),ROOM$(I
,2):: NEXT I
90 FOR I=1 TO 29 :: READ ADJ$(I):: NEXT I
100 FOR I=1 TO 11 :: READ DTE$(I),GU(I):: NEXT I
110 FOR I=1 TO 9 :: READ PEOPLE$(I):: NEXT I
120 FOR I=1 TO 18 :: READ ACT$(I):: NEXT I
130 G(1)=1 :: R=1 :: C=1 :: FLAG=0
140 CALL CLEAR
150 N$="You're in Location #"&STR$(R):: GOSUB 2000 ::
N$="Date: "&DTE$(VAL(ROOM$(R,0)))&", 1884" :: GOSUB 20
00
170 PRINT "Ghosts present:" :: FOR I=1 TO LEN(ROOM$(R,
1)):: PRINT I;"-";PEOPLE$(VAL(SEG$(ROOM$(R,1),I,1))):: 
 NEXT I
190 PRINT "Action taking place:" :: N$="  "&ACT$(VAL(R
OOM$(R,2))):: GOSUB 2000
200 IF C=10 THEN 300
210 N$="Which Location comes next (0 restarts)" :: GOS
UB 2000 :: INPUT NR
220 IF NR=0 THEN 130
230 IF NR=R OR NR>29 THEN 140
240 FOR I=1 TO C :: IF NR=G(I)THEN N$="You've already
been there!" :: GOSUB 2000 :: GOTO 210
```

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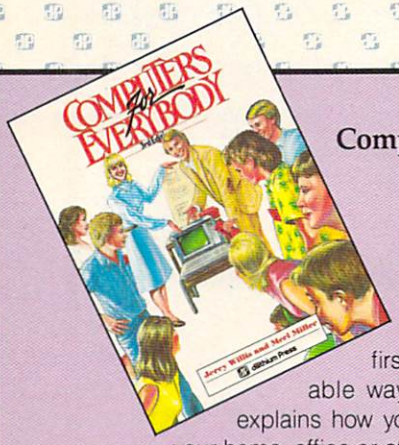

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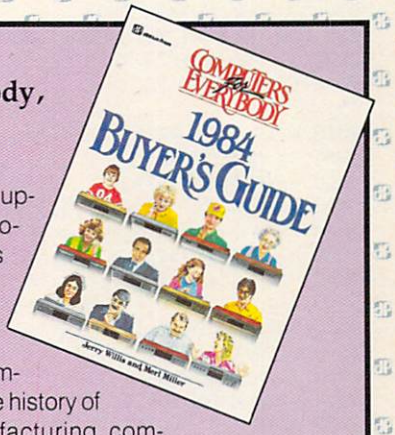

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```
250 NEXT I :: LE=0
260 FOR I=1 TO (LEN(ADJ$(R)))/2 :: IF NR=VAL(SEG$(ADJ$
(R),I*2-1,2))THEN LE=1
270 NEXT I
280 IF LE=0 THEN N$="You can't get there from here!" :
: GOSUB 2000 :: GOTO 210
290 C=C+1 :: G(C)=NR :: R=NR :: GOTO 140
300 N$="You've made ten moves. Press any key to contin
ue." :: GOSUB 2000
310 CALL KEY(0,K,S):: IF S=0 THEN 310
320 CALL CLEAR :: PRINT "Your sequence was:" :: PRINT
330 FOR I=1 TO 10 :: PRINT G(I);:: FLAG=FLAG+(G(I)<>IN
T(SQR(GU(I)-10))):: NEXT I
 :: PRINT
340 IF FLAG<>0 THEN G$="Sorry! " :: NO$="not "
350 IF FLAG=0 THEN G$="Congratulations! " :: NO$=""
360 PRINT :: N$=G$&"You have "&NO$&"followed vanessa's
 steps." :: GOSUB 2000
370 IF NO$="" THEN END
380 FOR DELAY=1 TO 3000 :: NEXT DELAY :: GOTO 130
2000 IF LEN(N$)<28 THEN PRINT N$ :: RETURN
2010 FOR I=1 TO 28 :: IF ASC(SEG$(N$,I,1))=32 THEN J=I
-1
2020 NEXT I :: PRINT SEG$(N$,1,J):: N$=SEG$(N$,J+1,LEN
(N$)):: GOTO 2000
3000 DATA 1,1234678,2,2,18,1,11,185,1,3
3010 DATA 165,1,2,185,1,3,16,1,4,175,3
3020 DATA 3,156,1,4,185,1,6,14,4,5,152
3030 DATA 5,4,157,1,5,154,5,5,152,5,6
3040 DATA 154,4,7,147,6,6,14,4,7,13,7
3050 DATA 8,1234678,8,7,14,6,8,1234678
3060 DATA 9,10,16,10,9,1,11,10,48,12,9
3070 DATA 1,13,8,1234678,14,9,1,15,10,5,17,9,9,18
4000 DATA 0203040506,0104,0106,01020507,01040608
4010 DATA 01030509,040811222324,05070912,060813
4020 DATA 161114,071012,08111314,091215
4030 DATA 10121517,131418,191710,14161820
4040 DATA 151721,2516,25172126,18202729
```


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```
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4060 DATA 262128,27,21
5000 DATA January 2,11,February 2,35,March 21,74
5010 DATA April 12,154,August 2,206,September 30,299
5020 DATA October 12,410,November 23,686,November 24,5
39
5030 DATA November 25,494,February 12,794
6000 DATA Vanessa,Mother,Father,Amanda,Aunt Emily,Sidn
ey,Septimus,Sebastian,Nobo
dy
7000 DATA Courtship,Debut party,Ice skating,Jealous qu
arrel
7010 DATA Reads invitation,Secret meeting,Frozen pie f
ight
7020 DATA Hula-hoop contest,Brunch party,Lovers united
!
7030 DATA Finds note -"If you love me -- meet me right
 outside."
7040 DATA Eloping on horse,Finds two movie tickets,Tur
key feast
7050 DATA Finds two plane tickets,Construction,Snoring
,Nothing
```

Timex Sinclair 2068/*Mystery Manor*

```
10 DIM R$(29,11)
20 DIM J$(29,10)
30 DIM D$(11,17)
40 DIM G(12)
50 DIM P$(9,10)
60 DIM A$(18,54
70 DIM S(12)
80 FOR I=1 TO 29:READ R$(I,1 TO 2),R$(I,3 TO 9),R$(I,1
0 TO 11):NEXT I
90 FOR I=1 TO 29:READ J$(I,1 TO 10):NEXT I
100 FOR I=1 TO 11:READ H$:LET D$(I)=H$+", 1984":READ G
(I):NEXT I
110 FOR I=1 TO 9:READ P$(I,1 TO 10):NEXT I
120 FOR I=1 TO 18:READ A$(I):NEXT I
130 LET S(1)=1:LET R=1:LET C=1:LET FLAG=0
140 CLS
150 LET N$="YOU'RE IN LOCATION #+STR$(R):GOSUB 1000:LE
T N$="DATE: "+D$(VAL(R$(R,1 TO 2))):GOSUB 1000
160 PRINT "GHOSTS PRESENT:":FOR I=3 TO 9:IF R$(R,I)="0
" THEN GOTO 180
170 PRINT I;"- ";P$(VAL(R$(R,I)))
180 NEXT I
190 PRINT "ACTION TAKING PLACE:":LET N$="  "+A$(VAL(R$
(R,10 TO 11))):GOSUB 1000
200 IF C=10 THEN GOTO 300
210 LET N$="WHICH LOCATION COMES NEXT (0 RESTARTS)":GO
SUB 1000:INPUT NR
220 IF NR=0 THEN GOTO 130
230 IF NR=R OR NR>29 THEN GOTO 140
240 FOR I=1 TO C:IF NR=S(I) THEN LET N$="YOU'VE ALREAD
Y BEEN THERE!":GOSUB 1000:GOTO 210
250 NEXT I:LET LE=0
260 FOR I=1 TO 5:IF J$(R,I*2-1 TO I*2)<>"  " THEN IF N
R=VAL(J$(R,I*2-1 TO I*2)) THEN LET LE=1
270 NEXT I
280 IF LE=0 THEN LET N$="YOU CAN'T GET THERE FROM HERE
!":GOSUB 1000:GOTO 210
290 LET C=C+1:LET S(C)=NR:LET R=NR:GOTO 140
300 LET N$="YOU'VE MADE TEN MOVES. PRESS ANY KEY TO CO
NTINUE.":GOSUB 1000
310 IF INKEY$="" THEN GOTO 310
320 CLS:PRINT "YOUR SEQUENCE WAS:":PRINT
330 FOR I=1 TO 10:PRINT S(I);:LET FLAG=FLAG+(S(I)<>INT
(SQR(G(I)-10))):NEXT I:PRINT
340 IF FLAG<>0 THEM LET Q$="SORRY! ":LET Z$="NOT "
350 IF FLAG=0 THEN LET Q$="CONGRATULATIONS! ":LET Z$="
"
360 PRINT:LET N$=Q$+"YOU HAVE "+Z$+"FOLLOWED VANESSA'S
 STEPS.":GOSUB 1000
```

```
370 IF Z$="" THEN STOP
380 PAUSE 300:GOTO 130
1000 LET J=0
2000 IF LEN N$<32 THEN PRINT N$:RETURN
2010 FOR X=1 TO 32:IF CODE N$(X)=32 THEN LET J=X
2020 NEXT X:PRINT N$(1 TO J):LET N$=N$(J+1 TO LEN N$):
GOTO 1010
3000 DATA "01","1234678","02","02","1800000","01", "11
","1850000","01","03","1650000","01"
3010 DATA "02","1850000","01","03","1600000","01", "04
","1750000","03","03","1560000","01"
3030 DATA "04","1850000","01","06","1400000","04", "05
","1520000","05","04","1570000","01"
3040 DATA "05","1540000","05","05","1520000","05", "06
","1540000","04","07","1470000","06"
3050 DATA "06","1400000","04","07","1300000","07", "08
","1234678","08","07","1400000"
3060 DATA "06","08","1234678","09","10","1600000","10"
,"09","0100000","11","10","4800000"
3070 DATA "12","09","0100000","13","08","1234678","14"
,"09","0100000","15","10","0500000"
3080 DATA "17","09","0900000","18"
4000 DATA "0203040506","0104","0106","01020507","01040
608"
4010 DATA "01030509","040811222324","05070912","060813
"
4020 DATA "161114","071012","08111314","091215"
4030 DATA "10121517","131418","191710","14161820"
4040 DATA "151721","2516","25172126","18202729"
4050 DATA "232407","22242607","23252207","24192026","2
3252027"
4060 DATA "262128","27","21"
5000 DATA "JANUARY 2",11,"FEBRUARY 2",35,"MARCH 21",74
5010 DATA "APRIL 12",154,"AUGUST 2",206,"SEPTEMBER 30"
,299
5020 DATA OCTOBER 12",410,"NOVEMBER 23",686,"NOVEMBER
24",539
5030 DATA "NOVEMBER 25",494,"FEBRUARY 12",794
6000 DATA "VANESSA","MOTHER","FATHER","AMANDA","AUNT E
MILY","SIDNEY","SEPTIMUS","SEBASTIAN","NOBODY"
7000 DATA "COURTSHIP","DEBUT PARTY","ICE SKATING","JEA
LOUS QUARREL","READS INVITATION","SECRET MEETING","FRO
ZEN PIE FIGHT","HULA-HOOP CONTEST","BRUNCH PARTY","LOV
ERS UNITED"
7010 DATA "FINDS NOTE - IF YOU LOVE ME -- MEET ME RIGH
T OUTSIDE"
7020 DATA "ELOPING ON HORSE","FINDS TWO MOVIE TICKETS"
,"TURKEY FEAST","FINDS TWO PLANE TICKETS","CONSTRUCTIO
N","SNORING","NOTHING"
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM/*Mystery Manor*
Make the changes indicated for the Apple, except change the number 64 to 31 in lines 2000 and 2010.

Apple/*Mystery Manor*
Use the base version with these alterations: Omit the statement `CLEAR 2000` in line 10. Replace `CLS` with `HOME` in lines 140 and 320. Change the number 64 to 40 in lines 2000 and 2010. Finally, change line 310 to read:

```
310 GET K$
```

IBM PC/*Mystery Manor*
Use the base version, omitting the statement `CLEAR 2000` in line 10 and changing the number 64 to 80 in lines 2000 and 2010.

VIC-20/*Mystery Manor*
Use the Commodore 64 version, but replace the number 64 with 22 in lines 2000 and 2010.

A FARMER AND HIS FLOCK

BY CHRISTIAN CULPEPPER

PHOTOGRAPH BY PEGGY CULPEPPER

The author and his entourage at feeding time.

Our family lives on a small California farm complete with 10 chickens, two geese, two ducks, three cats, four kittens, one dog, and three computers. The computers are valuable assistants.

Peg, my wife, and I are usually up by 5:30 a.m. The chickens start making a racket by 6:00—they've got it down to about 15 minutes before feeding time. It sounds like a menagerie, all the clucking, clacking, and honking! Even the sparrows join in; they sit along the tree limb and peep! The computer helps me determine just the right amount of grains, gravel, and oyster shells to mix for the chickens, depending on such changing variables as weather.

Our chickens are good companions. Sometimes when I'm tilling the garden I turn them loose, and they walk along behind me looking for worms and potato bugs. We grow all our own vegetables in four garden plots which we rotate each year. You have to constantly keep the soil tested, and another program of mine

---

CHRISTIAN CULPEPPER *is a farmer and computer consultant and his wife, Peggy, is a computer coordinator for Zellerbach Paper Company. In their spare time they can be found in the sky flying small planes, or seated in front of a computer, playing adventure games.*

helps me determine the right kind and amount of fertilizer to use. We also keep a home-canning inventory on our computer, which greatly aids us in planning the next garden by showing us how fast we're going through different foods.

EQUAL IMPORTANCE

The computer shares equal importance with the hammer, saw, and screwdriver on our farm. It cuts down my work load by a large percentage, but it is not a cure-all by a long shot. Once the seed is in the ground, or the feed in the chickens, a power much greater than a TI or an Apple takes over. After all, you can't fool Mother Nature.

After a long day's work, I sometimes relax in the evening by writing fun programs that my wife and two kids can enjoy. Occasionally, the inspiration will come from some project I'd been working on during the day.

The idea for *Scales* came while I was busy thinking about rebuilding a Volkswagen engine. You have to balance all the pistons, so I'd made myself a set of scales with some wood and string. Then it struck me: Why not write a scales game on the computer?

HOW THE GAME WORKS

The aim of my game is simple: You are given a set of scales and a random list of 25 weights. The object is to balance the 25 weights on the four arms of the scale without toppling it. You will first be asked which arm, and then which weight, you wish to add. There is a catch, however. If arm A is heavier than arm B (or vice versa) by more than 75 grams, the scale topples and the game ends. The same holds true for arms C and D.

There is another catch. If the total weight of arms A and C is heavier than the total weight of arms B and D (or vice versa) by more than 50 grams, the scale will topple. This also holds true if arms A and D are greater than C and B (or vice versa) by more than 50 grams.

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/*Scales*

```
10 FAST
20 DIM A(25)
30 DIM X$(64)
40 FOR I=1 TO 64
50 LET X$(I)=CHR$ 0
60 NEXT I
70 CLS
80 FOR X=1 TO 25
90 LET A(X)=INT (RND*64)+1
100 NEXT X
110 SLOW
120 LET A=0
130 LET B=0
140 LET C=0
150 LET D=0
160 PRINT AT 8,14;CHR$ 166
170 PRINT AT 9,14;CHR$ 128
180 PRINT AT 10,12;CHR$ 168;CHR$ 128;CHR$ 128;CHR$ 128
;CHR$ 169
190 PRINT AT 11,14;CHR$ 128
200 PRINT AT 12,14;CHR$ 167
210 PRINT AT 0,0;X$
220 PRINT AT 2,0;X$
230 PRINT AT 4,0;X$
240 PRINT AT 0,0;"THE WEIGHTS ARE THESE:"
250 FOR W=1 TO 21 STEP 5
260 FOR Y=W TO W+3
270 PRINT A(Y);" - ";
280 NEXT Y
290 PRINT A(W+4)
300 NEXT W
310 PRINT AT 15,0;"ENTER ARM     "
320 INPUT B$
330 IF B$="A" OR B$="B" OR B$="C" OR B$="D" THEN GOTO
380
340 PRINT "UH, UH.  NO SUCH ARM."
350 PAUSE 180
360 PRINT AT 16,0;X$
370 GOTO 310
380 PRINT AT 16,0;X$
390 PRINT AT 15,0;"ENTER WEIGHT"
400 INPUT E
410 LET K=0
420 FOR S=1 TO 25
430 IF A(S)=E THEN LET K=S
440 NEXT S
450 IF K<>0 THEN GOTO 490
460 PRINT "NO SUCH WEIGHT LEFT."
470 PAUSE 180
480 GOTO 380
490 LET A(K)=0
500 IF B$="A" THEN LET A=A+E
510 PRINT AT 7,14;A;"   "
520 IF B$="B" THEN LET B=B+E
530 PRINT AT 13,14;B;"  "
540 IF B$="C" THEN LET C=C+E
550 PRINT AT 10,9;"  "
560 PRINT AT 10,9;C
570 IF B$="D" THEN LET D=D+E
580 PRINT AT 10,18;D;"   "
590 FOR K=1 TO 25
600 IF A(K)>0 THEN GOTO 630
610 NEXT K
620 PRINT "YOU DID IT. YOU BALANCED","THE SCALES."
630 IF A>B+75 OR B>A+75 THEN GOTO 680
640 IF C>D+75 OR D>C+75 THEN GOTO 680
650 IF A+D>C+B+50 OR C+B>A+D+50 THEN GOTO 680
660 IF A+C>B+D+50 OR B+D>A+C+50 THEN GOTO 680
670 GOTO 210
680 CLS
690 PRINT AT 5,0;"CREEEAK CRASH BANG TINKLE"
700 PRINT "OOOOOOOOPS.  IT TUMBLED."
710 PRINT ,,"TO TRY AGAIN, PRESS ""P""."
720 PAUSE 4E4
730 IF INKEY$="P" THEN GOTO 70
740 STOP
```

TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!
2. Remember to press RETURN or ENTER *after* every completed program line.
3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

FAMILY COMPUTING wants to publish your best original computer programs. We are especially interested in those that have useful applications in the home and that do not exceed 100 lines. Send us a diskette or tape containing two copies of your program, plus a listing (preferably a printout). Include your name, address, phone number, age, computer model, the program title with a brief description of it, and the memory and level of BASIC required to The Programmer, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. We will pay $50 for those we publish. If you want your diskette or tape returned, enclose a stamped, self-addressed mailer. FAMILY COMPUTING cannot assume responsibility for the loss of or damage to any unsolicited materials.

WHAT'S IN STORE

NEW HARDWARE ANNOUNCEMENTS*

APRICOT COMPUTER; APPLE MODEM; WICO JOYSTICK; ALPHACOM, CANON, AND SMITH-CORONA PRINTERS

COMPUTERS

Apricot

MANUFACTURER: ACT (North America) Inc., 3375 Scott Blvd., Suite 336, Santa Clara, CA 95051; (408) 727-8090
PRICE: $2,495

While American computer manufacturers wonder when and how the Japanese will enter the U.S. market, there is no question about the British: They are here. First came Sinclair (marketed here by Timex) and Osborne. In the last few months, two other British-born computers were introduced in the U.S.—the Dragon and the Acorn. Now comes the Apricot, which has been selling in Britain since October 1983.

The Apricot, manufactured by Applied Computer Techniques (ACT), one of Great Britain's largest microcomputer companies, is designed more for the office than for the home. But some of its features are quite advanced for the price and give a hint of what computer fans can expect in the next few years—in short, more for their money.

The 256K RAM Apricot comes with an attached 80-column monitor, one or two 3.5-inch Sony disk drives, a 16-bit microprocessor (Intel 8086), and three separate operating systems. (ACT says the Apricot can run 90 percent of IBM PC software.) The Apricot comes with five "executive" software packages, a built-in modem and calendar, and a connection for a mouse. The nine-inch monitor has extremely high resolution, 800 × 400, and six "associated" touch-sensitive keys whose functions vary depending on the program used. Besides all this, the 17.5-pound computer is portable.

These products have been announced by manufacturers, but are not necessarily in the stores yet. Some products may still be under development, and others may be in test markets only. Call or write the manufacturer for expected date of delivery.

PRINTERS

Canon Printers

MANUFACTURER: Canon U.S.A., 1 Canon Plaza, Lake Success, NY 11042; (516) 488-6700
PRICE: $595 (PW-1080A); $795 (PJ-1080A); $895 (PW-1156A)

Canon, which has just organized a new Printer Division, has three new printers. The PW-1080A and PW-1156A are "near letter-quality" dot-matrix printers. The PJ-1080A is an ink-jet color printer.

The PW-1080A prints an 80-column line at 160 characters per second, while the PW-1156A prints 156 characters per line at the same speed. Characters are printed in a 24 × 16 dot-matrix grid, which means that the dots are very close together and nearly imperceptible.

Both units have friction- and tractor-feed capability, allowing use of single-sheet, fan-fold, roll, or multipart copy paper. These two dot-matrix printers use removable cartridge ribbons, have a high-resolution graphics printing capability, and can print user-defined (optional) characters. Optional character fonts—italic, gothic, and others—are available.

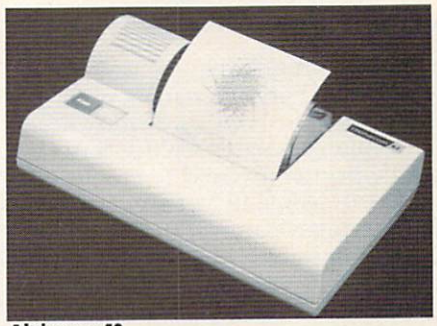
Canon PW-1080A

The Canon ink-jet printer prints up to seven colors simultaneously, at 37 characters per second on an 80-column line. The PJ-1080A prints on either plain single-sheet paper or plastic see-through transparencies for overhead projectors. It uses two ink cartridges, one black, the other tricolor.

All three Canon printers have been designed for quiet operation.

Alphacom 42 and 81 Printers

MANUFACTURER: Alphacom Inc., 2323 S. Bascom Ave., Campbell, CA 95008; (408) 559-8000
PRICE: $79 (Alphacom 42); $214 (Alphacom 81); interface cables, $20 to $60



Alphacom 42

Alphacom has slashed the prices of its two thermal printers, and added cables that connect them to a variety of computers. The Alphacom 42 and 81 can both interface with Commodore 64, Atari, Texas Instruments, IBM PC, and Timex Sinclair computers.

Alphacom 81

The 42 model prints two 40-column lines a second, and can print uppercase and lowercase letters. The 81 prints 80-column lines, at 100 characters per second. Both printers use a friction-feed mechanism to hold roll paper.

Smith-Corona TP-II Plus and Smith-Corona Ultrasonic III Messenger

MANUFACTURER: Smith-Corona, 65 Locust Ave., New Canaan, CT 06840; (203) 972-1471
PRICE: $645 (TP-II Plus), $149 (optional tractor-feed); $635 (Ultrasonic III Messenger typewriter/printer), $170 (Messenger Module interface)

→

WHAT'S IN STORE
NEW HARDWARE

Smith-Corona, the typewriter and computer printer manufacturer, has two new products: an improved version of its TP-II daisy-wheel printer, and a combination typewriter/printer. The TP-II Plus features both RS-232 serial and Centronics parallel

Smith-Corona Ultrasonic Messenger III

interface ports, automatic underscoring and carriage return, and programmable margins. Print wheels and ribbon cassettes for this letter-quality printer are easy to change.

The Ultrasonic III Messenger typewriter/printer is one of the new breed of portable electronic typewriters that can, with the addition of an interface (in this case, Smith-Corona's Messenger Module), double as letter-quality printers. The Messenger Module has both RS-232 serial and Centronics parallel ports for connection to most home and personal computers. Ultrasonic III employs snap-in print wheels and drop-in ribbon cassettes for neat and fast ribbon changes and comes with its own double-walled carrying case.

Smith-Corona Messenger Module

Typewriters that double as computer printers are best used primarily as typewriters and only occasionally as printers, according to reports from users.

MISCELLANEOUS

Apple Modem

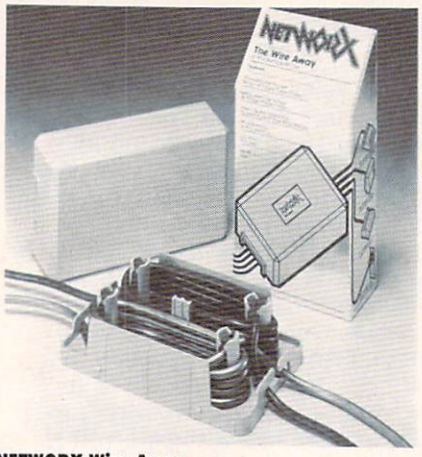
MANUFACTURER: Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010
PRICE: Under $300 (300 baud); under $500 (1,200 baud)

The new direct-connect modem from Apple, which should be available now, comes in two models—a 300-baud and a 1,200-baud type.

Designed to rest under a telephone in order to save desk space, these modems will work with any Apple personal computer (including Lisa) in conjunction with the appropriate software. (To use this with the Apple II plus and IIe, you need the Apple Super Serial Interface Card, which is part of the package.)

The Apple modem will connect to any telephone line with the standard telephone jack. It comes with a Demo-Pak from CompuServe, a Premium Pak from The Source, and an accessory kit. This includes operating manuals, a modem interface cable, and an *Apple Term* program disk—software that allows you to link your computer to other computers.

NETWORX Wire Tree and Wire Away



NETWORX Wire Away

MANUFACTURER: NETWORX, 203 Harrison Pl., Brooklyn, NY 11237; (212) 821-7555
PRICE: $69 (Wire Tree); $12 (Wire Away)

NETWORX, a division of North American Philips (maker of Magnavox and Norelco products), has developed a filtered power strip to protect computer circuitry and memory from power surges, power spikes, and radio frequency interference (RFI). Called the Wire Tree, the power strip plugs into a grounded socket with a nine-foot power cord and has four sockets for a computer and three peripherals. It has an illuminated (when on) on/off switch and an easily replaceable fuse.

The Wire Away from NETWORX is hand-sized, and it allows up to four cables or wires of up to 18-gauge thickness and up to 14 feet in length to be wound and placed inside the Wire Away box. It attaches via four screws to a desk or table so that you may stash your wires in an out-of-the-way spot.

Sprite Animation Peripheral Card for Apple Computers

MANUFACTURER: Synetix Inc., 10635 N.E. 38th Pl., Kirkland, WA 98033; (206) 828-4884
PRICE: $149 (Sprite I); $249 (Sprite II); $395 (SuperSprite)

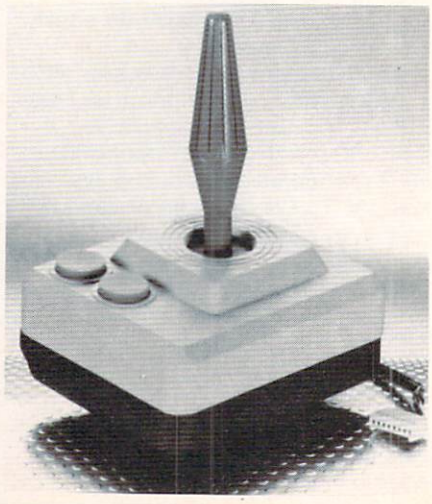
With the Sprite I or II peripheral cards, any Apple II computer can control up to 32 sprites (a programmable object that can be moved around on the monitor screen). Sprites can be used to create animated sequences, fast-action games, or educational programs. The Sprite II also has a sound generator, a speaker, and software that allows you to program realistic sound effects. These can be synchronized with the sprite action.

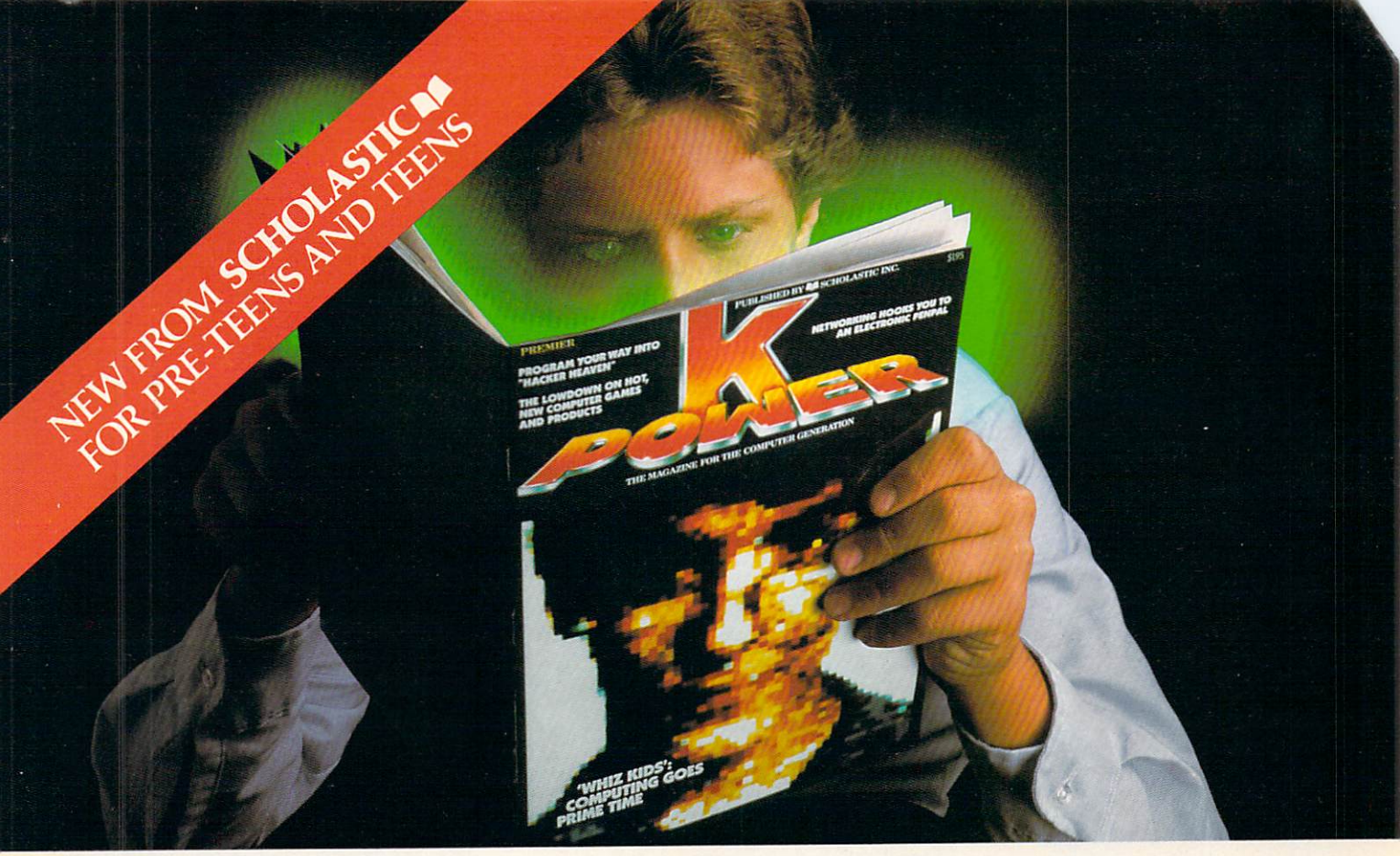
The Sprite I and II peripheral cards are further supported by *StarSprite* software (Avant-Garde Creations Inc., P.O. Box 30160, Eugene, OR 97403; [503] 345-3043). The three *StarSprite* packages (*I*, *II*, and *III*), at $79 each, offer users some advanced programming tools—so advanced that Avant-Garde offers to review users' creations for possible publishing. Synetix's SuperSprite package comes with *StarSprite I* software.

Wico Joystick

MANUFACTURER: Wico Corp., 6400 W. Gross Point Rd., Niles, IL 60648; (312) 647-7500
PRICE: $49

Wico Corp. offers a joystick in three versions: for the Radio Shack TRS-80 Color Computer, the Apple II/II plus/IIe, and the IBM PC. This joystick has a modified grip handle and uses two independent fire-function buttons located on the base. All Wico joysticks come with a one-year limited warranty.





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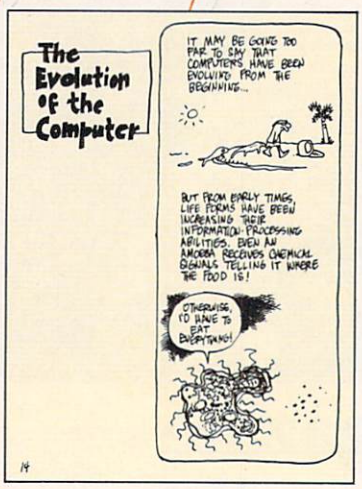
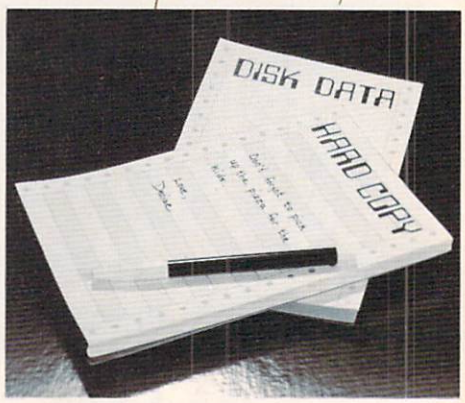
WHAT'S IN STORE



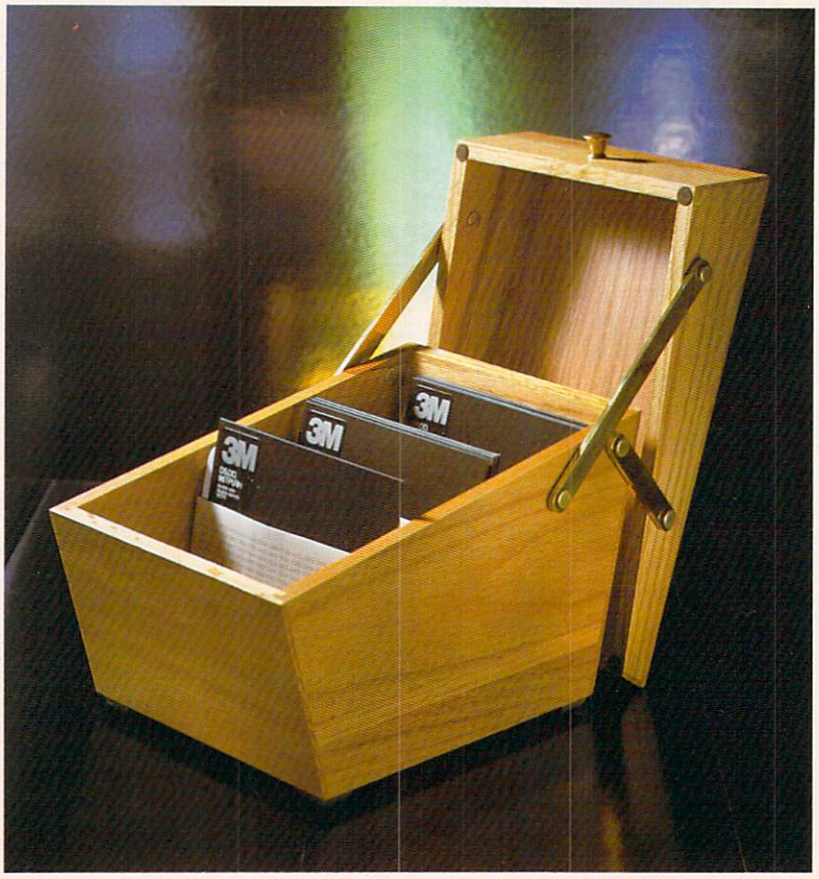
THE LIGHTER SIDE OF HIGH TECHNOLOGY

If you're baffled by binary notation, swamped with software, or confused by computer components (and who isn't?), you may find relief in *The Cartoon Guide to Computer Science*, by Larry Gonick. Here, condensed, whimsically illustrated, and humor-coated in a manageable and entertaining format, are the history and essentials of computer science. Rarely is a guide so informative and such a delightful distraction at the same time. Published by Barnes & Noble, *The Cartoon Guide* is available for $5.25 at many bookstores and computer stores.



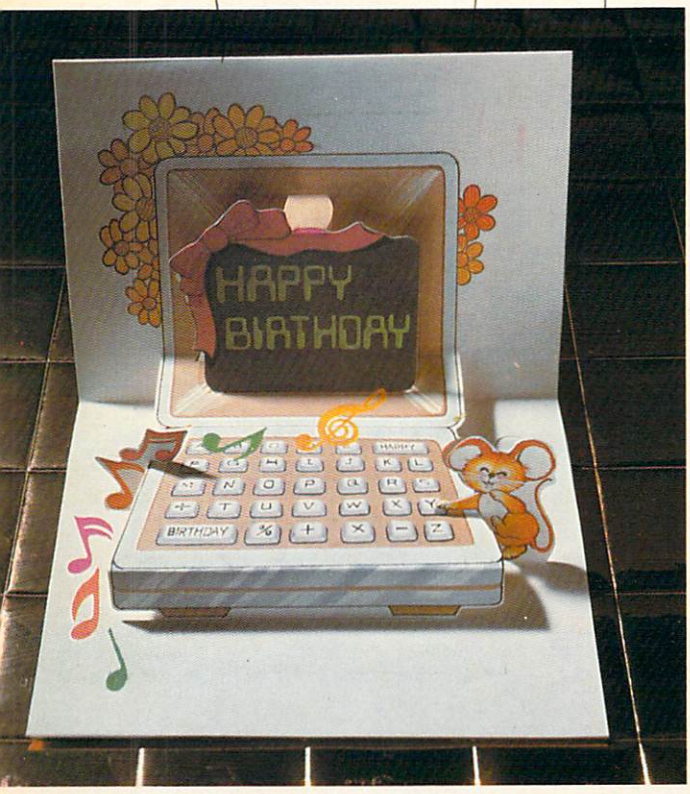
RANDOM-ACCESS MEMO PADS

The urge to scribble and scrawl lives on in spite of changes brought about by high technology. If you're like most of us, going on-line has by no means brought an end to your memo-writing and note-taking. Use computer-style note paper adorned with digital headings for grocery lists, telephone messages, and other hand-written miscellany. Each pad comes with 75 sheets of paper, and is available for $3 at card and stationery stores or from the manufacturer, Computer Personals, P.O. Box 376, Southampton, PA 18966; (215) 947-6175.



DISK STORAGE DELUXE

Disk files have never received very high marks for looks. Discover the DisCover and house your disks handsomely in sturdy oak or walnut cases. With its brass hinge and handle, the case could well become a modern-day classic. The oak model (pictured here) is available for $64.95, the walnut for $69.95, from the LeLand Young Company, P.O. Box 4127, Bay Pines, FL 33504; (813) 961-7371.

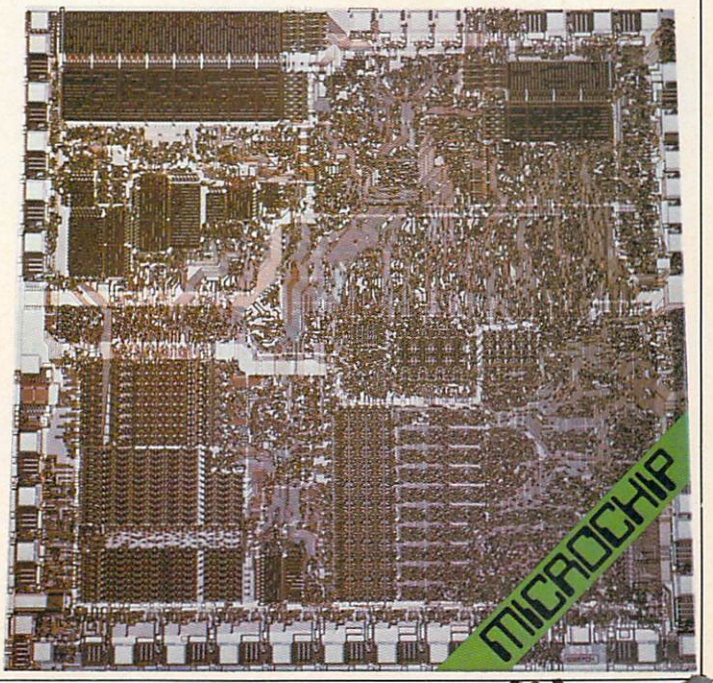


MICRO MUSIC BIRTHDAY CHIPS

Many people regard age the same way we regard computer technology: "Less is more." It's only fitting, therefore, that this birthday greeting contain a tiny microchip, a music chip that plays "Happy Birthday" when the pop-up card is opened. It's available for $3.25, plus 50 cents for postage and handling, from Timely Treasures, 7654 169th St., Suite 101, Flushing, NY 11366; (212) 380-3077.

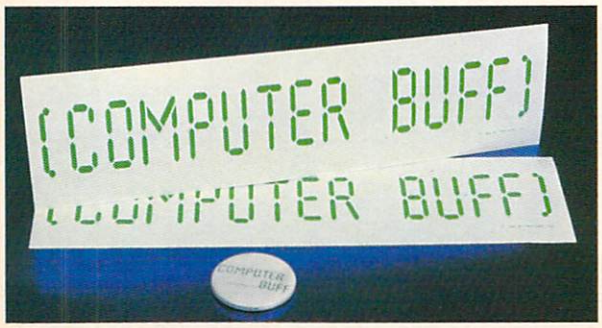
THE PUZZLING MICROCHIP

Try piecing together the mysterious microchip, magnified into an 18- by 18-inch jigsaw puzzle. No computer experience required, although a good deal of patience is necessary to put together this 600-piece puzzle, available for $7.95, plus $2 shipping and handling, from Sweet Gum, 15490 NW 7th Ave., Suite 204, Miami, FL 33169; (800) 237-9338.



COMPUTER BUFFS UNITE

On the road, in the office, or in school, identify yourself with Computer Buff bumperstickers and pins in bright green digital type. They're available for $1 each at computer and gift stores or from the manufacturer: Byteware Inc., P.O. Box 6725, Lawrenceville, NJ 08648; (609) 882-5769.



QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews of some programs follow the chart.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS/HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
EASY SCRIPT Commodore 1200 Wilson Dr. West Chester, PA 19380 (215) 431-9100 approx. $80 © 1983	Comprehensive word-processing program takes care of most correspondence and writing needs, and includes special hyphenation features.† —AKER	Commodore 64 (disk).	Defective disks replaced free; $5 fee if user-damaged or for backup.	★★★	★★★	★★★	n/a	A	★★★★
ESP>CALC New Leaf, Inc. 120 Lynnhaven Belleville, IL 62223 (618) 397-3660 $43.50 (cassette) $47.50 (disk) ©1983	Powerful spreadsheet program simulates financial ledger page, which helps track budgets and finances for small businesses or big families. May be overkill for some families. —WOODS	Commodore 64 (disk or cassette), and VIC-20, 24K (disk or cassette).	Defective disks replaced free; $5 fee for user-damaged cassette, $10 for disk; user makes backup copy.	★★★	★★★★	★★★★	n/a	A	★★★
HOMEWORD Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 $69.95 ©1983	Innovative, easily learned word processor employs pictures, also known as "icons," in explicit instructions for simple use, for correspondence, schoolwork, and random writings.† —KRENGEL	Apple II/II plus/IIe, 64K (disk); also available for Commodore 64 (disk); Version for IBM PC*jr*, 128K (disk), distributed through IBM, is planned.	Defective disks replaced free w/in 90 days, $5 fee thereafter; user makes backup copy.	★★★★	★★★★	★★★★	★★★★	E	★★★★
NEWSCRIPT ProSoft P.O. Box 560 North Hollywood, CA 91603 (213) 764-3131 $124.95 ©1982	Versatile word processor for the serious user, can be expanded to accommodate spelling and grammar checkers, and mailing lists for mass mailings, business correspondence, and other professional uses. —KRENGEL	TRS-80 Models I/III/4 (in Model III mode), 48K (disk).	Defective disks replaced free w/in 90 days; $5 fee if user-damaged; user makes backup copy.	★★★★	★★★★	★★★	n/a	D	★★★★
TIME IS MONEY Turning Point Software 11A Main St. Watertown, MA 02172 (617) 923-4441 $100 ©1983	Finance-management program, suitable for home or small business uses, is versatile, fast, and easy to learn and use, includes automatic check printout and graphics display.† —WILSON	Apple II/II plus/IIe/III w/ emulator, 48K (disk).	Defective disks replaced free; $10 fee if user-damaged or for backup copy.	★★★★	★★★★	★★★	n/a	E	★★★★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

READER'S DIGEST INTRODUCES PLAY-AND-LEARN SOFTWARE FOR A VERY TOUGH AUDIENCE.

In the eyes of any red-blooded, American four-five-or-six-year-old, computer software is nothing more than a new toy. And when it comes to a new toy, kids have never been known to fool around. It's either good or bad, fun or boring, worth playing with or not, right from the start.

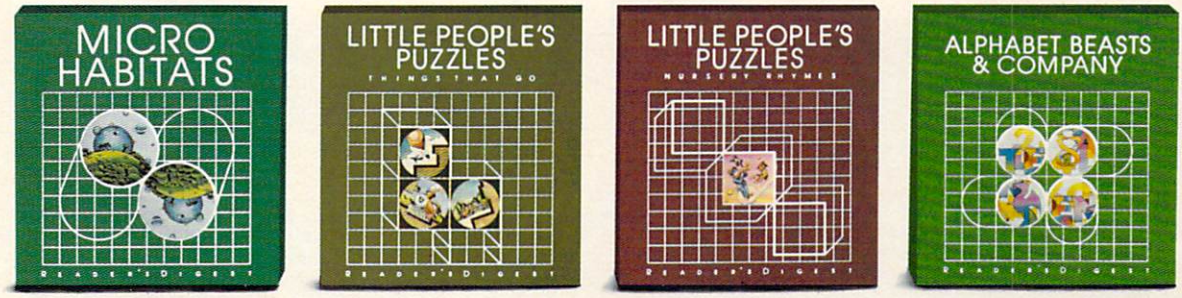
Nothing in between and no bones about it.

So when we created our early learning series, we did it without any illusions. And, judging from the kids who've tried our games so far, there's not a dull learning tool in the group.

Each game is fun. And worth playing over and over. So our programs continually reinforce early learning skills along with basic computer commands. And unlike some other early learning programs, Reader's Digest Software™ games are designed so that even non-readers can follow the fun.

Whether it's Little People's Puzzles™ for pleasure, Micro Habitats,™ the creative construction set, or kooky, unspooky Alphabet Beasts and Company,™ there's a lot of color, animation, sound and even music to turn our toughest customers into a captive audience. Look for it now at your software store or call Customer Service at 800/431-8800. (In NY, AK, HI: 914/241-5727.)

SOFTWARE GOOD ENOUGH TO GO OUT AND BUY A COMPUTER FOR.



Little People's Puzzles, Alphabet Beasts and Company, and Micro Habitats are available for Apple® II, II Plus, IIe: 48K and disk drive, and Commodore™ 64 Machine and disk drive. Color monitor is required for Little People's Puzzles, preferred for Alphabet Beasts and Company. Color monitor and joystick preferred for Micro Habitats. Alphabet Beasts and Company, and Micro Habitats available for IBM® PC and PCjr in spring, 1984. Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, New York 10570.

R E A D E R ' S D I G E S T

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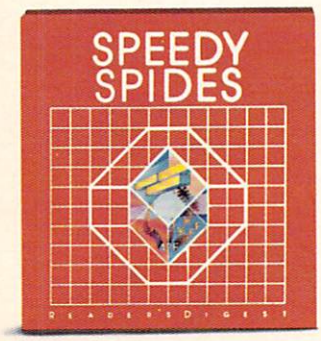
EDUCATION/FUN LEARNING

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
THE GAME SHOW Computer Advanced Ideas 2550 Ninth St. Suite 104 Berkeley, CA 94709 (415) 526-9100 $39.95 ©1983	Kids ages 8 and up, younger with assistance, learn some vocabulary, spelling, and general knowledge in game-show format; flawed by spelling errors and misleading clues. —MORRIS	Apple II/II plus/IIe, 48K (disk).	Defective disks replaced free w/in 90 days, $12 fee thereafter.	★	★ ★	★ ★	★ ★	A	★
GERTRUDE'S PUZZLES The Learning Company 545 Middlefield Rd. Suite 170 Menlo Park, CA 94025 (415) 328-5410 $44.95 ©1982	Kids ages 6 and up learn pattern and shape recognition by grouping objects according to similarities or differences in series of puzzles introduced by Gertrude, the goose. —MORRIS	Apple II/II plus/IIe/III, 48K (disk); also available for Commodore 64 (disk); IBM PC, 64K (disk). IBM PC requires color card.	Defective or user-damaged disks replaced free w/in 1 year.	★ ★ ★	★ ★	★ ★ ★	★ ★ ★	A	★ ★
MASTER MATCH Computer Advanced Ideas 2550 Ninth St. Suite 104 Berkeley, CA 94710 (415) 526-9100 $39.95 ©1983	Kids ages 4 and up practice memory skills and learn general factual knowledge by matching pairs in quiz-show format. Additional disks and ability to add or edit quizzes enhance program's value. —MORRIS	Apple II/II plus/IIe/III, 48K (disk); also available for Commodore 64 (disk); IBM PC, 64K (disk). IBM PC requires color card.	Defective or user-damaged disks replaced free w/in 1 year.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	A	★ ★
MASTERTYPE Scarborough Systems 25 N. Broadway Tarrytown, NY 10591 (914) 332-4545 $39.95 $49.95 (IBM) ©1983	Anyone over 8 learns to touch-type by blasting away invading letters and words in this genuinely fun arcade-game tutorial.† —MORRIS	Apple II/II plus/IIe/III w/emulator, 48K (disk). Also available for Atari 400/800/1200XL, 32K (disk), 16K (cartridge); Commodore 64 (disk or cartridge); IBM PC, 64K (disk).	Defective or user-damaged disks replaced free w/in 30 days, $6 fee thereafter.	★ ★ ★ ★	★ ★	★ ★ ★ ★	★ ★ ★	A	★ ★ ★ ★
MATH DUEL Computer Software Associates The Silk Mill 44 Oak St. Newton Upper Falls, MA 02164 (617) 527-7510 $19.95 ©1983	Kids ages 5 and up drill and practice addition, subtraction, multiplication, and division to escape from the clutches of a fire-breathing dragon. —HERRINGTON	Commodore VIC-20 (cassette).	Defective cassettes replaced free w/in 90 days; backup copy available for $5.	★ ★ ★	★ ★ ★	★ ★	★ ★ ★ ★	E	★ ★
MICROZINE (Vol. 1, #2) Wizware/Scholastic 730 Broadway New York, NY 10003 (212) 505-3000 $39.95 ©1983 (Special subscriptions offered)	Kids ages 10 and up learn direction and basic music notation, read through an adventure-like "twist-a-plot" story, and play fun word game in magazine on a disk.† —BUMGARNER	Apple II/II plus/IIe, 48K (disk).	Defective disks replaced free w/in 90 days, $5 fee thereafter.	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
SPACE RESCUE HesWare 150 N. Hill Dr. Brisbane, CA 94005 (800) 624-2442 $39.95 ©1983	Kids ages 9 and up (readers) must locate kidnapped scientist on different planets in set period of time, while conserving resources in exciting program that teaches planning ahead and astronomy.† —BYRNE	Commodore 64 (disk).	Defective disks replaced free w/in 6 months; $5 fee if user-damaged or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	D	★ ★ ★ ★
TYPING TUTOR II Microsoft 10700 Northup Way Bellevue, WA 98004 (206) 828-8080 $24.95 ©1982	Kids over 8 learn to type in straight drill-and-practice program with unique ability to monitor which letters consistently trouble the novice typist. —MORRIS	Apple II/II plus/IIe, 48K (disk).	Defective disks replaced free w/in 90 days, $15 fee thereafter.	★ ★	★ ★ ★	★ ★	n/a	A	★ ★
WINDOW (Vol. 1, #3) Window, Inc. 824 Boylston St. Chestnut Hill, MA 02167 (800) 852-5001 $29.95 ©1983 $120 for 5 issues	Kids who can read (and adults) sample games and educational/fun-learning software, and learn computer concepts, in article-like programs on magazine on a disk.† —WILSON	Apple II/II plus/IIe/III w/emulator, 48K (disk).	Defective disks replaced free; user makes backup copy.	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	★ ★ ★	E	★ ★ ★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

INTRODUCING QUIZZES, CONTESTS AND SPIDERS.



Maybe computer quizzes haven't made it to your list of all-time game favorites yet. But Speedy Spides™ is different.

First, it gets a couple of swinging spiders in on the act. And second, two kids can pounce on words, or zero in on numbers, together. In direct competition! If neither player speeds a spide to the correct answer, the program supplies it. You can play Speedy Spides alone, too, but the thrill of the contest makes it even better. There are nine fact files on the disk—plus a big bonus editor that lets you enter up to 26 new quizzes into play. On almost any subject. So any-brainy-body in the family can play.

Reader's Digest Software™ created Speedy Spides to help take the bugaboos out of learning. And to give everybody at home a chance to play a fact-and-fun filled game together. Look for it at your software store or call Customer Service at 800/431-8800. (In NY, AK, HI: 914/241-5727.)

Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, N.Y. 10570.

Speedy Spides runs on Apple®II, II Plus, IIe: 48K and disk drive and Commodore 64™ and disk drive. Use of paddles optional.

SOFTWARE GOOD ENOUGH TO GO OUT AND BUY A COMPUTER FOR.

R E A D E R S D I G E S T

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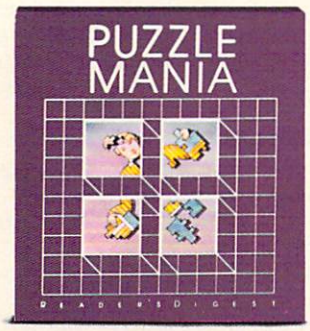
GAMES

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
BUZZARD BAIT Sirius Software, Inc. 10364 Rockingham Dr. Sacramento, CA 95827 (916) 366-1195 $34.95 ©1983	Protect humanoids from hungry giant buzzards and their ravenous chicks in easy-to-play shoot-'em-up good for ages 6+. —DELSON	Apple II/II plus/IIe, 48K (disk). Also available for IBM PC, 64K (disk). IBM PC requires color card.	Defective disks replaced free w/in 30 days, $5 fee thereafter.	★ ★	★ ★	★ ★	★ ★ ★	E	★ ★
CASTLE WOLFENSTEIN Muse Software 347 N. Charles St. Baltimore, MD 21201 (301) 659-7212 $29.95 ©1983	Secure secret Nazi war plans and escape from prison using arcade skills to shoot pursuing guards, and strategy smarts to outwit them, in game suitable for ages 10+.† —DELSON	Apple II/II plus/IIe, 48K. Also available for Atari 400/800/1200XL, 32K (disk); Commodore 64 (disk).	Defective disks replaced free; backup copy available for $10.	★ ★ ★ ★	★ ★ ★	★ ★	★ ★	A	★ ★ ★
CONQUEROR Computer Software Assoc. The Silk Mill, 44 Oak St. Newton Upper Falls, MA 02164 (617) 527-7510 $24.95 ©1983	Vie with up to 14 opponents for land, resources, warriors, and, ultimately, imperial control over medieval Europe and Asia Minor in flexible, exciting war game good for ages 12+.† —DELSON	Commodore VIC-20, 16K (cassette).	Defective cassettes replaced free w/in 90 days; backup copy available for $5.	★ ★ ★	★ ★ ★	★ ★	n/a	A	★ ★ ★ ★
FORTRESS Strategic Simulations, Inc. 883 Stierlin Rd. Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 $34.95 ©1983	Place castles on a 6×6 square board. Attempt to monopolize the field in competition with pre-programmed opponents that "learn" as play proceeds in Othello-like game good for ages 8+.† —DELSON	Apple II/II plus/IIe/III w/emulator, 48K (disk). Also available for Atari 400/800/1200XL, 48K (disk).	Full refund w/in 14 days; defective disks replaced free w/in 30 days, $10 fee thereafter.	★ ★ ★	★ ★ ★	★ ★	★ ★	A	★ ★ ★
MAJOR LEAGUE HOCKEY Thorn EMI 1370 Ave. of the Americas New York, NY 10019 (212) 977-8990 $39.95 ©1983	Skate against human opponents or take on one of the computer's three skill levels in nonstop action game, good for ages 10+. Some may find the puck too hard to follow. —DELSON	Atari 400/800/1200XL, 16K (cartridge); joystick required.	Defective cartridges replaced through dealer.	★ ★ ★	★ ★	★ ★	★ ★ ★	D	★ ★ ★
MOTOR MANIA United Microware Industries, Inc. P.O. Box 1649 Orange, CA 92666 (714) 639-9396 $35 ©1982	Steer high-performance racing car around hazards, altering speed to suit road conditions and refueling at gas stations, while scoring points for everything you do properly. Ten skill levels make this ideal for ages 7+. —DELSON	Commodore 64 (cassette); joystick required.	Defective material replaced free w/in 90 days; backup copy available for $5.	★ ★ ★	★ ★	★ ★	★ ★ ★	A	★ ★ ★
PIRATE'S ADVENTURE Texas Instruments P.O. Box 53 Lubbock, TX 79408 (800) 842-2737 $24.95 ©1981	Voyage among pirates and cutthroats, collect booty and transport it safely to your apartment in this text adventure game, the first of a lengthy series. —DELSON	TI-99/4A, 16K (disk or cassette).	Defective material replaced free w/in 90 days, nominal fee thereafter or if user-damaged.	★ ★	★ ★	★ ★	n/a	D	★ ★
QUIZAGON Counterpoint Software 4005 W. 65th St. Suite 218 Minneapolis, MN 55435 (800) 328-1223 $39.95 ©1983	Answer trivia questions in computerized version of the board game Trivial Pursuit, that lacks exciting play action or strategy elements and contains odd mix of easy and difficult questions. —DELSON	Apple II/II plus/IIe, 48K (disk); also available for Commodore 64 (disk); IBM PC, 64K (disk).	Defective disks replaced free w/ in 30 days, $5 fee thereafter.	★ ★	★ ★	★ ★ ★	★ ★	E	★ ★
STAR WARRIOR Epyx 1043 Kiel Ct. Sunnyvale, CA 94089 (408) 745-0900 $40 ©1980	As an intergalactic soldier, you fend off alien aggressors in this role-playing adventure game, suitable for ages 8+, especially enjoyable for 12+.† —DELSON	IBM PC, 64K (disk); also available for Apple II/II plus/IIe, 48K (disk); Atari 400/800/1200XL, 32K (disk or cassette); TRS-80 Models I/III, 16K (cassette), 32K (disk).	Defective material replaced free w/in 30 days, $10 fee thereafter.	★ ★ ★	★ ★ ★ ★	★ ★	★ ★	A	★ ★ ★
WAR OF THE SAMURAI Krell Software Corp. 1320 Stony Brook Rd. Stony Brook, NY 11790 (516) 751-5139 $39.95 ©1983	You and up to three other players place pieces on square grid board, capturing enemies while trying to secure your own territory. Difficult variation on the ancient strategy game Go. —DELSON	Apple II/II plus/IIe, 48K (disk).	Defective disks replaced free; $10 fee if user-damaged.	★ ★ ★	★	★ ★	n/a	D	★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor: ★★ Average: ★★★ Good: ★★★★ Excellent: n/a Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart

INTRODUCING PUZZLE MANIA. 7 GREAT PUZZLES CREATED BY US.

THE OTHERS BY PUZZLE MANIACS.



Puzzle Mania™ is a challenging jigsaw program for puzzle lovers.

Puzzle Mania is also an inspired jigsaw program for puzzle creators.

Because in addition to the seven great puzzles on the disk, you can create your own pictures on the screen, paint them in sixteen different colors and let the program turn them into puzzles to save on a separate disk.

Each Puzzle Mania puzzle (including your own creations) can be played on six levels of difficulty. There's help when you need it. And all turns are tallied. So you can turn the puzzle play into competitive play. If you have to part with a puzzle before it's finished, there's a stop-and-save feature built into the program, too.

Reader's Digest Software™ created Puzzle Mania for kids and their friends and their parents and their grandparents and everybody else who likes fun and games. Look for it at your software store or call Customer Service at 800/431-8800. (In NY, AK, HI: 914/241-5727.)

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Warranty information available upon request by writing to: Reader's Digest Services, Inc., Microcomputer Software Division, Pleasantville, N.Y. 10570. Puzzle Mania runs on Apple® II, II Plus, IIe: 48K and disk drive. Commodore™ 64 Machine and disk drive. Color monitor required. IBM® PCjr version available late spring. Puzzle Mania and Reader's Digest Software are trademarks of The Reader's Digest Association, Inc. Apple is a registered trademark of Apple Computer, Inc. Commodore is a trademark of Commodore Electronics Limited. IBM is a registered trademark of International Business Machines, Inc.

WHAT'S IN STORE
SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 118 for such information as backup policies and addresses of software manufacturers.

HOME BUSINESS & HOME MANAGEMENT

Easy Script

HARDWARE REQUIREMENTS: Commodore 64 (disk)
MANUFACTURER: Commodore
PRICE: Approximately $80

Although its hefty manual might lead you to believe otherwise, *Easy Script* really *is* easy—to learn and to use. The guide's thick because the program has so many valuable features.

Easy Script lets you do all the things you'd normally do with a word-processing program. You type in and edit text, make insertions, and move blocks of words to different portions of your document. If you have any reason to write at all, whether it's a letter, homework assignment, club newsletter, or creative work of your own, these features will prove very helpful.

Easy Script has a few sophisticated features unusual for a program priced as it is. For instance, a special mail-merge option lets you maintain a file of names and addresses and print out business or form letters automatically.

The only problem I encountered with *Easy Script* revolved around printing out in "double-strike mode." In order to underline portions of my work, or print out certain words in boldface, the printer must pass over lines twice, once for the initial words, twice for underlines or emphasis. Dot-matrix printers drop a fraction of an inch in order to create the effect of boldface. But it seems that *Easy Script* does not make allowances for this drop. The result is a printed page, which, if filled with underlines or boldfaced words, looks spotty and tends to slant off to one side.

Easy Script is such an impressive package for its price that this drawback may not bother you. You may overlook it entirely in order to avail yourself of an otherwise remarkably versatile program.

—SHARON ZARDETTO AKER

Homeword

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 64K (disk); also available for Commodore 64 (disk); IBM PC*jr.*, 128K (disk) expected from IBM
MANUFACTURER: Sierra On-Line
PRICE: $69.95

A word-processing program can be an extremely powerful tool. But if the instructions and prompting within the program are hard to follow or cryptic, as many often are, then most of this power will go unharnessed. *Homeword* is a program of unbelievable simplicity. And its performance has not been sacrificed to its ease of use.

To begin with, the manual introduces the novice to computer com-

ponents like the disk drive and monitor. Between these straightforward instructions, the simplicity of the program's layout, and an audio-cassette introduction to the package, a 10-year-old could load and run *Homeword* with little or no computer experience whatsoever.

The primary virtue of *Homeword* is its use of "icons" (the Greek word for image). To help the newcomer through the program, the variety of options are depicted instead of written. Using the right and left arrow keys (on the Apple IIe), you simply point to the picture that represents the task you want to perform—prepare text for printing, double spacing, etc. As you enter text, a small window at the bottom right-hand corner of the screen shows you how the words will appear on your final printed-out letter, essay, or other document.

The only feature lacking in *Homeword* is more-sophisticated routines for which many families would rarely, if ever, have much use. You cannot develop form letters for use with a file list of names and addresses, for instance.

This may be a serious shortcoming for small-business applications. However, for ordinary household tasks—personal writing, correspondence, homework assignments—that require easy writing, saving, and editing of text, *Homeword* is ideal.

—LARRY KRENGEL

Time Is Money

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)
MANUFACTURER: Turning Point Software
PRICE: $100

Of the several home-budget and home-accounting programs I've examined, most are either far too limited or far too complex and confusing to make any sense or be of any use for home or small-business applications. My search for a package that will help me keep track of my financial transactions is over. I've discovered *Time Is Money*.

An introductory tutorial greatly simplified my ordinarily painful first moments with the program. In a matter of 15 minutes, I was zipping through screens in pre-programmed sample files—viewing, sorting, editing with ease.

When it came time for me to create files for my own needs, I opted to keep my initial accounts simple. This is where I discovered another of *Time Is Money*'s wonders.

Most programs require that you define an entire financial or account system before you enter any information. *Time Is Money* permits you to build a system from scratch, adding on to it as you see fit. In this way, I could begin organizing my finances by computerizing a single checking account, adding another and another as needed. A little later, I could include an expense account, expand it to cover additional categories of expenses and other sources of income. Within an hour and a half I created the nucleus of my home-accounting system. And I can expand and refine it as I gather and organize more information.

With space for 240 separate types of assets and liabilities, 240 different sources of income, and 240 different tax deductions, the program is certainly more than adequate for the majority of home uses. The program's ability to print out checks and finance reports, and create graphs of my financial status are other capabilities which I hope to grow into in the future.

The list of advantages goes on and

on. It's a program that seems tailor-made to the individual—easy to use, apply, and expand. —DAVID WILSON

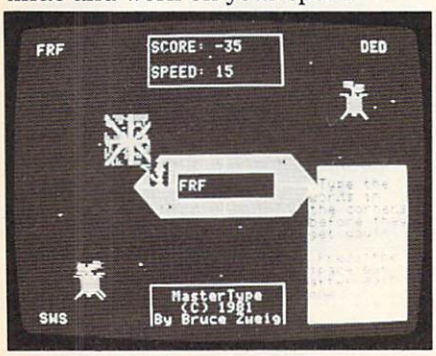
EDUCATION/ FUN LEARNING

MasterType

HARDWARE REQUIREMENTS: Apple II/II plus/IIe/III w/emulator, 48K (disk); also available for Atari 400/800/1200XL, 16K (cartridge), 32K (disk); Commodore 64 (disk or cartridge); IBM PC, 64K (disk)
MANUFACTURER: Scarborough Systems
PRICE: $39.95; $49.95 (IBM)

A user-friendly pussycat—no more threatening than your favorite arcade game—*MasterType* combines the challenge and excitement of a *Space Invaders*-type game, with the otherwise tedious task of learning to touch-type.

At a command ship at screen-center, you must blast away oncoming missiles launched from attacking letters located at the four remote corners. Type the letters correctly and the missile is destroyed. Type fast enough and you'll destroy the word entirely. A new one takes its place until you've eliminated 10 words. A brief summary of your performance follows each wave, with the option of either continuing to the next barrage or ending the game. At the end of four consecutive series of words, the program provides a complete analysis of your progress, including recommendations as to whether you should go on to the next level or continue and work on your speed.



Lessons are ordered systematically: The easiest levels test letters on the home row, more difficult levels test numbers and punctuation. You can even create your own lessons, with words you are most likely to use or words you find particularly troublesome.

This is just the beginning of a bewildering array of options. You can play as a beginner, changing missile speed to fit your abilities. The Atari version even allows you to mix both upper- and lower-case letters for practice with the SHIFT key.

Kids are genuinely excited by this program, and its instructional value is undeniable. At high speeds, you absolutely cannot take your eyes off the screen without getting blown up. In spite of a few drawbacks (inadequate documentation, difficulties in skipping from level to level without rebooting the program), it is hard to imagine a more clever way to teach touch-typing without making a big fuss about it. —TONY MORRIS

Microzine (Vol. 1, #2)

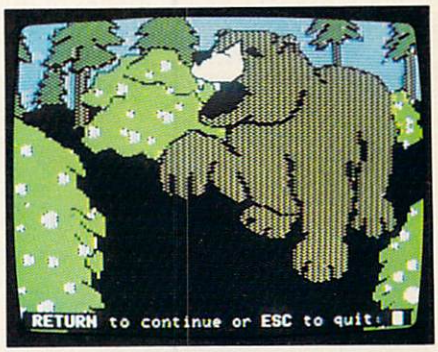
HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)
MANUFACTURER: Wizware/Scholastic
PRICE: $39.95 (subscription rates available)

The words "envelope," "vent," and "burner" take on a new meaning in "Ride the Wind." This tutorial about hot-air balloons is one of four programs on the second issue of *Microzine*, Scholastic's interactive magazine on a disk. The package also includes "Melody Maker," a simple music-making program, "Northwoods Adventure," a story with a variety of different plot twists and turns, and "Word Ladder," a challenging word game. The four combine in a remarkably varied package for an unusually good price.

Our favorite program was the music program. You can create and save simple compositions and have them automatically illustrated with colorful bar graphs or star bursts. Use the keys that correspond to specific notes, or use a sort of modified keyboard. Children delight in storing their own creations.

The balloon race wasn't such a hit at our house. With variables such as wind direction and speed, players must pilot their balloons to a landing site, using either the keyboard or game paddles. The potential for fun-learning here is diminished a little by the snail's pace of the balloons—not nearly fast enough for my 10-year-old's attention span.

A regular feature of *Microzine*, the twist-a-plot story is a tale with many different possible outcomes. In "Northwoods Adventure," you are camping with friends in the wilderness, you awaken one morning before your companions and set off for a day-break stroll. Depending on the choices you make, you may encounter a wild animal or jump into a canoe, among other activities. The good graphics, combined with the variety of turns the plot may take



combine to maintain the kids' interest in this inviting form of reading practice.

The final offering, "Word Ladder," is an addictive word game calling on your ability to visualize words, like hangman. The programmed words may pose real problems for some 10-year-olds. (Do you know the definition of "goad" and "moot?") You can test family and friends by adding your own ladders.

Between the section called COMPUTER STUFF and the regular procedures of going from point to point on the two sides of the disk, your kids will develop terrific comfort with the computer. Preparing disks on which to save additional word ladders and melodies will familiarize your kids with using the computer as a tool—an invaluable lesson in and of itself.

All in all, you'll find that the variety of "chapters," and the ability to alter and save work in the music and word programs make for an unusually rich package. My guess, however, is that the suggested 10-year age range be amended, pushed up a bit to compensate for an agonizingly slow balloon race, and oversophisticated word-ladder.

—MARLENE ANNE BUMGARNER

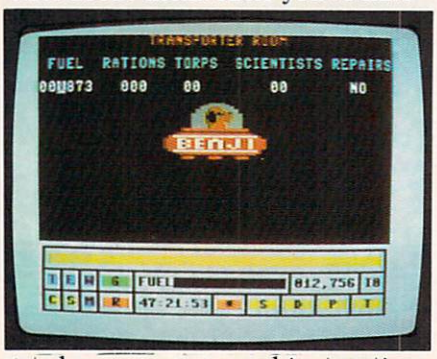
Space Rescue

HARDWARE REQUIREMENTS: Commodore 64 (disk)
MANUFACTURER: HesWare
PRICE: $39.95

It wasn't the kids who bought this entertaining education program, it was me. It's a real educational family computer game. Beginner levels are simple enough for younger fans of

its canine hero, Benji, while higher levels challenge older kids.

Voyaging in your trusty ship, *The Star Woof*, you must help Benji rescue a group of scientists kidnapped by aliens and held captive on planets in the solar system. Plan ahead by looking at maps and statistics of the planets, finding out as much as possible about them. After you've navi-



gated your course, send instructions to the engine room. You're on your way. With vivid graphics, comprehensive vital statistics compiled by N.A.S.A., and an actual correlation between distances traveled and availability of fuel and resources, the adventure amounts to quite a learning experience.

At the lower levels (ranks Pilot Officer through Squadron Leader), you are pretty much along for the ride, with Benji in charge of all the difficult stuff. This is known as the training period. But at higher levels (rank Wing Leader through Fleet Marshal), you'd better know your planets, and be comfortable with the *Woof*'s controls.

The game is not simple. It took quite a lot of consulting the manual and Dad. But it's not one that kids will tire of in the near future. It incorporates some of the best sounds and graphics I've seen for the Commodore 64. Traveling to and from planets, coordinating fuel supply and provisions for the trip will challenge your children's wits and give them a taste for astronomy. Flying the ship, warding off attacking aliens, and avoiding oncoming meteors will tickle their arcade urges. We're looking forward to more programs of this caliber from HesWare.

—BETSY BYRNE

Window (Vol. 1, #3)
HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)
MANUFACTURER: Window
PRICE: $29.95; $120 for 5 issues

One of the growing number of periodicals that come to you not as ink on paper, but files on a disk, *Window*'s major thrust is educational.

The topic of #3 is music. A brief, succinct "editorial" begins with a performance by G.P. Telemann and goes on to demonstrate the concept of tuneblocks. A review of *Music Theory*, the new set of programs from the Minnesota Educational Computing Consortium that teach the fundamentals of music, includes some samples from the software. A marvelous demonstration of Scarborough Systems' new *SongWriter* is accompanied by an abbreviated version that actually lets you compose, edit, save, and play your own tunes. A novel puzzle—"mystery melody"—completes the music section. Using a special program for unraveling codes along with the "Mini-Songwriter," you must name a mystery tune. It's no piece of cake, a project our family stayed up late one night to solve.

A review and demonstration of Spinnaker's *Snooper Troops*, a strategic board game, an exercise based on the simple computer language Logo, and other files round out the already over-stuffed package.

Delightfully free of the maddening waits to get to various files in the program, *Window* has something for everybody. My ordinarily non-musical 15-year-old plays with "Mini-Songwriter" regularly. The variety of programs, handsome graphics, and easy-to-read text make it fascinating and fun for kids as young as 12. On-screen prompts and on-disk documentation virtually do away with the need for written instructions.

Like *Microzine*, *Window* is a new-age concept for periodicals that works. I look forward to future issues.

—DAVID WILSON

GAMES

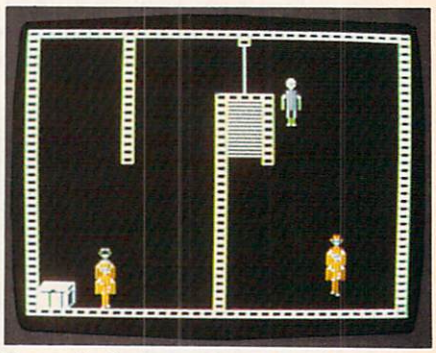
Castle Wolfenstein
HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200XL, 32K (disk); Commodore 64 (disk)
MANUFACTURER: Muse Software
PRICE: $29.95

You're a valiant World War II-type hero, captured by the Nazis and imprisoned in Castle Wolfenstein, a multi-level fortress that has proven impenetrable by all would-be escapees. Armed with your wits, a loaded pistol, and some luck, you must secure the secret Nazi war plans and make your way out of the castle. You'll encounter armed guards and S.S. storm troopers, some of whom you can fool into thinking you're one of them and many of whom you'll have to capture or kill in order to move past. Locked chests containing food, ammunition, uniforms, secret plans, and other helpful items are littered along the way. Every time you kill or capture a Nazi you can replenish your ammo or build up your grenade and key supply to help you along.

It's no surprise this has been one of the country's best-selling games for more than two years. It's exciting, requires thought to win, yet allows even beginning players, ages 10 and up, the chance to use arcade skills to fight through the first half-dozen rooms of this large maze. After several initial sessions with the game, the keyboard, joystick, or paddle controls become almost second nature.

One of the most unusual aspects of this game is the computer's "dialogue." If you catch a guard or a storm-trooper, he shouts "Kamerad!" (which the rules translate as "I surrender"). If you're spotted, they yell, "Achtung!" or "Halt!"

Castle Wolfenstein has one serious drawback: if you "die" within a few moments of beginning and want to start all over, you still have to go



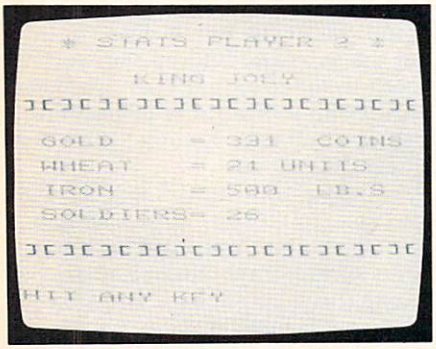
through the same long introduction, which drives even the most seasoned players up the wall.

—JAMES DELSON

Conqueror
HARDWARE REQUIREMENTS: Commodore VIC-20, 16K (cassette)
MANUFACTURER: Computer Software Associates
PRICE: $24.95

At last, here's a war game that's as

simple to learn as Risk and also offers a variety of play levels to suit every taste. You control a major Euro-



pean power in the Middle Ages and vie for imperial sovereignty over all the land from Britain to Spain, and east to Asia Minor.

In addition to the diplomacy, tactical, and strategical prowess required for success against opponents, the game calls on your ability to organize resources efficiently and advantageously. Your territory expands if you carefully manage your finances, population growth, food production, and standing army. In each play turn (representing from three to six months) you tax and distribute wealth, invade foreign territories, reinforce dependencies, harvest domestic food crops, and hire or fire soldiers. At the end of each round, players exchange goods and services, and make or break alliances at a common marketplace. The VIC-20 keeps track of all bookkeeping; players use a map board to move their armies from region to region.

Conqueror's rules are short and imprecise, allowing for great leeway in their interpretation. Although they take some time to fully comprehend, several brief practice games of short duration should enable players to get a feel for the game, and discover the potential for the complicated maneuverings.

The game can be played as a straightforward Risk-type encounter in which players take turns attacking and defending, with little concern for details other than the task of keeping their countries above water on a turn-to-turn basis. As a result, *Conqueror* is playable for ages 12 and up, or for families in which parents or older children can help youngsters nine and up master the play system.

For flexibility of play, potential audience size (up to 15 may compete), and continued interest to players of most ages, this is the most highly recommended VIC-20 program I've tested thus far. —JAMES DELSON

Fortress

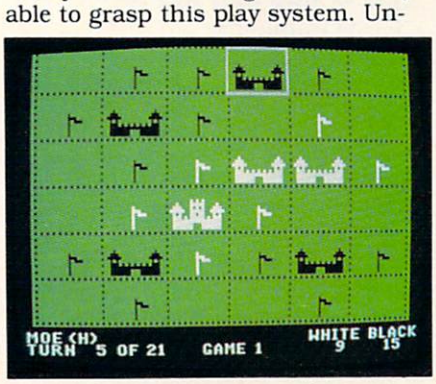
HARDWARE REQUIREMENTS: Apple II/II plus/IIe/III, 48K (disk); also available for Atari 400/800/1200XL, 48K (disk)
MANUFACTURER: Strategic Simulations, Inc.
PRICE: $39.95

Fortress is a strategy game that everyone can play right away. Its subtle intricacies, however, will take many hours for even the most dedicated gamer to grasp. Players place white or black castles on a six by six square board. Castles may be adjoined to combine forces that conquer in a chain reaction of strength or succumb in a domino reaction of defeat.

More abstract than any of Strategic Simulations' line of games viewed thus far, *Fortress* allows you to select either a preprogrammed opponent or create your own. In either case, the computerized competitor "learns" to play better on the basis of the moves it has experienced. You also have the option of taking on human opponents.

A very flexible play system allows for games of up to 54 turns in length with adjustable degrees of difficulty. Existing computerized players may be "cloned" for use in later games. The early-warning system that alerts players to imminent danger to their pieces may be switched off for more sophisticated, difficult play.

Play testers over eight were easily able to grasp this play system. Un-

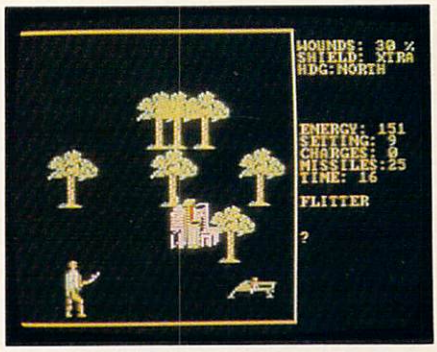


like many strategy games, it can be enjoyed instantly, and wrapped up in 10–15 minutes. An excellent manual offers strategy tips, and even includes the words to the song "Men of Harlech," played after each game. —JAMES DELSON

Star Warrior

HARDWARE REQUIREMENTS: IBM PC, 64K (disk); also available for Apple II/II plus/IIe, 48K (disk); Atari 400/800/1200XL, 32K (disk or cassette); TRS-80, Models I/III/4, 16K (cassette), 32K (disk)
MANUFACTURER: Epyx
PRICE: $40

Science-fiction fantasies come true in this role-playing adventure shoot-'em-up, loosely based on the space-dramas of the past few decades. As an intergalactic soldier, a "Fury"



armed and equipped with the latest in weaponry, space-suit armor, and special devices, you must confound and defeat your enemies. Choose from a number of different scenarios and arm yourself accordingly with blasters, powerguns, or guided missiles. Walk, fly, or jump across the planet's surface, releasing decoys to confuse the enemy, turning on your "infravisibility sensor" to avoid detection, using your "emissions sensor" to locate your prey. It's all in a day's work.

Like Epyx's other role playing adventure, *Crush, Crumble and Chomp!*, this imaginative item is as fun for the beginner as it is for the pro. With five skill levels, plus the option of building your own armor to take on the heavily armed opposition, it's like being the central character in a movie, in which you have to make up the script. One person can play alone, or two or three players can take turns controlling various aspects of the character's actions. One can take care of the moving while another keeps track of life functions and enemy location, and the third fires weapons. Players older than eight could move the character, but it required an older player, one over 12, to fully comprehend the firing methods of missiles and powerguns, as well as other variables best tackled by more experienced players. —JAMES DELSON

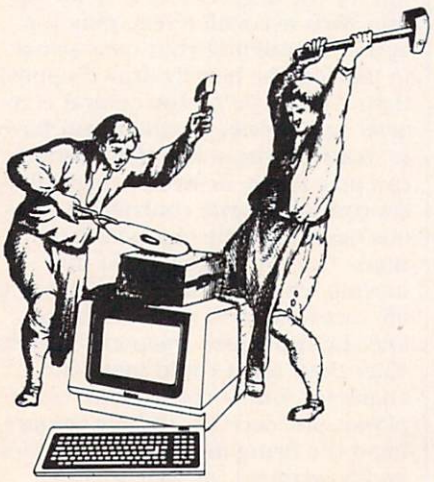
WHAT'S IN STORE
BOOK REVIEWS

Computer Wimp: 166 Things I Wish I Had Known Before I Bought My First Computer
John Bear, Ph.D.
Ten Speed Press, 1983
285 pp., softcover, $9.95

I can think of at least 166 praises for John Bear's humorous introduction to personal computers. Now, if I could sing them with half as much wit and insight! The 166 "wish-I'd-heard-that-befores" combine friendly advice, carefully outlined rules of thumb, and incisive journalism.

Having miniaturized along with the industry—from his first, $35,000 Digital computer to his $3,000 Apple (now a lot less expensive) and his $600 Tandy/Radio Shack model, Bear is truly a veteran of the computer war. As such, he has many pearls of wisdom to offer to the new recruits. For instance, pearl #66, "Advertised printing speeds are about as reliable as advertised miles per gallon," is accompanied by a detailed, helpful introduction to printer purchase. Striking a more philosophical note, Bear hazards, "Not computerizing at all is a valid alternative to having your own computer," whereupon he discusses the various uses for personal computers, warning consumers to look at needs and possible practical applications before leaping into the computer purchase.

Bear's delightful sense of humor and illustrations sprinkled throughout left me cackling more than once during my read-through. "If white smoke is rising from your disk drive," he quips, "that is probably where the problem lies (unless your disk drive has just elected the new Pope)." Bear's book rises also—above the abundance of mediocre computer literature. —ROBIN RASKIN



An illustration from John Bear's *Computer Wimp*.

Overcoming Computer Fear
Jeff Berner
SYBEX Computer Books, 1984
92 pp., softcover, $3.95

If the computer revolution is scaring you silly, by all means resist the temptation to pick up this book in spite of its comforting title and promises. ("Achieve greater power, professional mobility, increased income," reads the cover.)

Overcoming Computer Fear purports to alleviate the anxieties of those of us concerned that our ignorance is leaving us stranded amidst a tide of high technology. It's little more than a stream of consciousness about both the joys and the fears of computing. The impressive social implications of computers and the confusing jargon that frustrates so many are simplified to the point of being misleading. Berner quotes from sources such as *Time* and *Working Woman* to substantiate his arguments. His thoughts seem to pop out in no particular order.

I do think there is something for us to gain from the computer-related experiences of others. But an author should present more than a rehash of current computer propaganda. What Berner has done has been done before, and better. (Read Peter McWilliams's *The Personal Computer Book*.) —ROBIN RASKIN

Your First Personal Computer: How to Buy and Use It
Charlie Buffington
McGraw-Hill, 1983
326 pp., softcover, $8.95

After 20 years in the computer and electronics business, Charlie Buffington clearly knows his stuff. But, except for one of the book's main theses—know what you want from your computer before worrying about what computer you want—it's not the stuff that immediately comes to mind when most families embark on the task of buying and setting up their home computers. His book is engrossing and well organized, but definitely on the more technical end of the computer-literacy book continuum.

What does it mean if your computer uses the DOS system, EEPROMS, an ALU (arithmetic logic unit)? If you're itching to know these unexpurgated truths about the computer's internals, then Buffington's book will fit the bill. It does contain all the essential information you will need in order to make an intelligent entry into the world of computers. It's just embedded amidst more technical definitions.

Suppose you wanted to learn how to cook. You'd start with a simple 10-step recipe. You wouldn't dive into an elaborate cheese soufflé. The same thing goes for learning about personal computers. I think most rank beginners will find the sugar-coated approach infinitely more palatable. —ROBIN RASKIN

ZX81/TS 1000 Programming for Young Programmers
Linda Hurley
McGraw-Hill, 1983
88 pp., softcover, $9.95

The TS 1000 is an excellent computer for kids who may want to experiment with programming. Single-keystroke entry of BASIC commands such as PRINT is an ideal feature for fingers new to the keyboard. And the computer simply won't let the child enter a "syntax error" (which is an inconsistent or erroneous instruction). A TS 1000 book about programming written for kids is especially welcome.

Linda Hurley has compiled three dozen programs clever enough to appeal to adults, yet requiring little enough typing so that kids won't grow weary. The 10 lines of *The Sky at Night*, for instance, paint a downright elegant sky, complete with twinkling stars. Suggestions for modifications and improvements are written so that even my eight-year-old could understand. Each program is explained briefly, but not completely. The emphasis is on providing exciting programs so that the child feels he can really make the computer do something, rather than providing a course in BASIC.

While it is definitely successful as a supplement, the book's cover leads one to believe that it would teach the BASIC language from the ground up, which it most certainly does not. Nevertheless, it is worthwhile as a book that allows kids to experiment with interesting programs—and learn something along the way.
—ED HOORNAERT

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TI LOGO will swap for Sea Battle V 1.1. Evert 555-666-7777.

Space Marauder. Have the original version with space birds. Will trade for version with bats. Cap'n Video, 22 Elly Street, San Francisco, CA 94555.

HARDWARE

Commodore 64 available for sale, hardly used with disk dr $290.00. Call 112-555-9999.

Epson FX-80 printer w/graftrax $325, includes Apple cable. Rana disk drive 40/tpi will sacrifice $150. Call John at 505-999-1212 days, 123-3456 eves.

Trade my TRS-80 Color Computer for color monitor or used Sony TV. Call Dana at 411-200-8686.

Atari 800XL Large quantity, all peripherals available, will best most prices. MicroPlus, P.O. Box 000, San Francisco, CA 941X1.

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THE PRIMER

The Primer will appear in every issue of FAMILY COMPUTING. You might look to it for "Everything You Always Wanted to Know About Computers but Were Afraid to Ask." New information will be presented periodically, and existing sections will continually be adapted and updated. Whatever the format, the Primer is a handy reference guide to shopping for, setting up, and using a computer.

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the opposite page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

WHAT A COMPUTER DOES

Game Playing. Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more than one person at a time.

Education. Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills, by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

Paper work. When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "what if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and allows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process, by allowing you to change or rearrange words and paragraphs without retyping.

Information access. You can hook your home computer, via the telephone, to much larger computers at "information service" companies. This allows you to "call up" stock quotations, airline schedules, newspaper and magazine bibliographies, encyclopedias, and even games.

Also, by using the telephone lines you can hook your computer to other home computers around the country, and leave or receive messages. This practice is known as electronic mail. Several computers linked together are called a network.

Programming. It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your particular needs.

HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) INPUT: Instructions and information, in the form of a program and data, are entered into the computer. (2) PROCESSING: The computer executes the steps of the program. (3) OUTPUT: The results of the computer's work are made visible and available to the user. (4) STORAGE: Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various components. Following are the components needed for each of the four operating steps, and how they work.

Input. There are four basic ways of getting a program and/or other information into a home computer.

KEYBOARD. The keyboard looks and behaves much like that of a typewriter. Some keyboards have special keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

CASSETTE TAPE RECORDER. You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

DISK DRIVE. The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette recorder. But the cassette recorder is significantly cheaper.

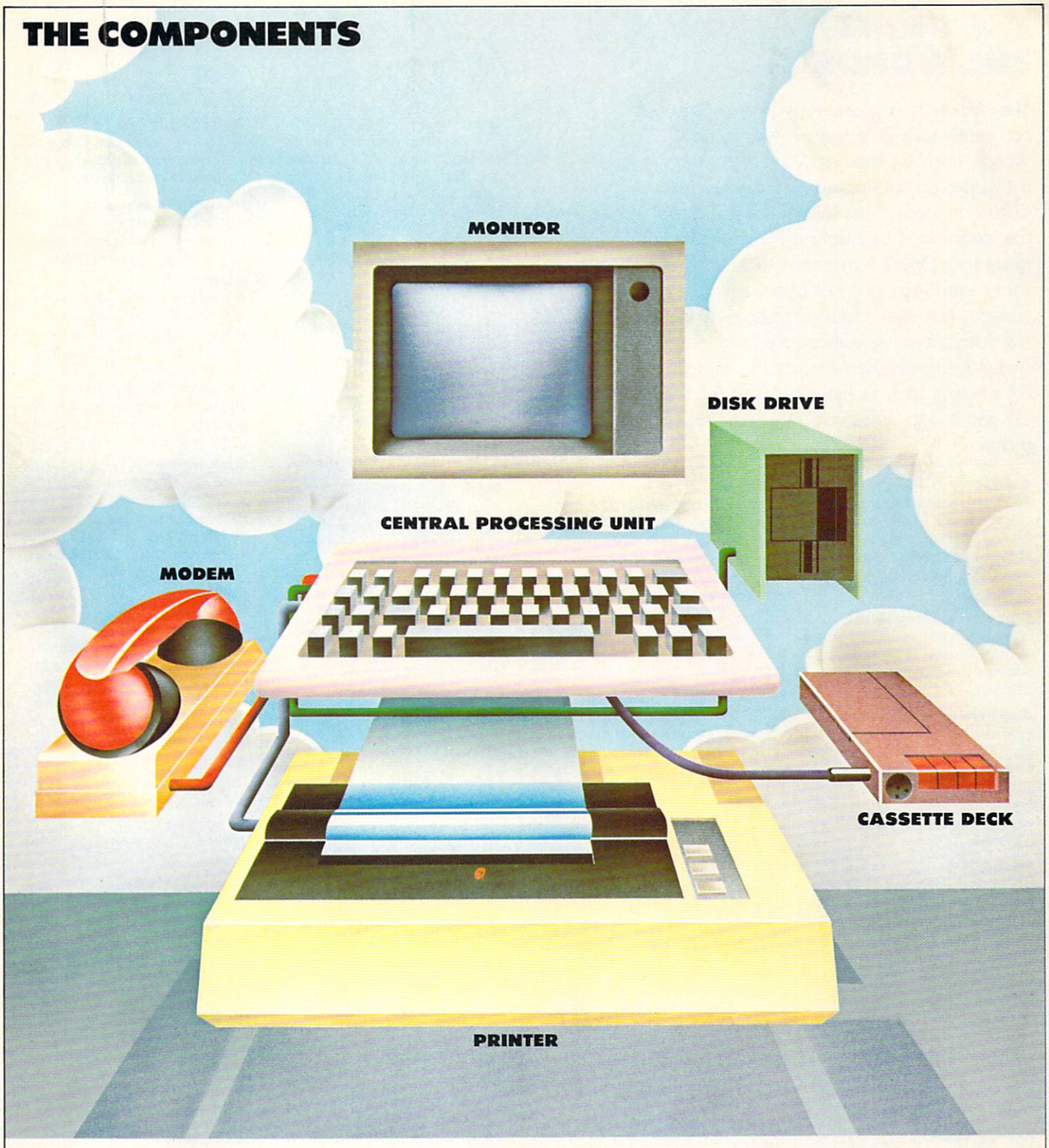
CARTRIDGE. A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

Processing. All input goes to the Central Processing Unit (CPU), located underneath the keyboard. The CPU is a maze of tiny electronic circuits, but it functions as a giant.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

Output. The visible result of a CPU's work is called output. Output is made available on the screen of a

THE COMPONENTS



TV or monitor, or from a printer.

Computers can be hooked to TVs or monitors, and to printers. In all cases special cables are required. In general, the monitor's screen display is sharper than the TV's.

Storage. When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you can transfer it into the computer's memory, and see it on the display screen.

You cannot store new information on a cartridge.

Peripherals. Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered a peripheral. One of the most popular peripherals is a modem.

MODEM. If you want to link your computer to an information service or other computers, you will need a modem. A modem holds a telephone receiver and transmits and receives data through phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

ILLUSTRATIONS BY ROBERT TIMPERIO

THE PRIMER
THE WORDS

The Words is a glossary of commonly used computer terms. Some are well-known English words, such as *read* and *write*, that have been incorporated into computer language and given different meanings. (Note: All italicized words in the definitions are defined in full elsewhere in the glossary.) Other terms that refer to a computer's inner workings are not often used in common speech, but are important because they are used in manufacturers' specifications and ads. Don't be awed by them. Remember the delight with which Americans took to the new NASA language over 20 years ago, when John Glenn first orbited the globe.

Access
To retrieve information from a storage place in the computer system. Access time is the amount of time it takes to obtain the information.

Address
A specific location in the computer's *memory* where a piece of information is stored. Each address is identified by a number.

Applications software
Programs that instruct the computer to perform one task or a group of related tasks, such as keeping track of a household budget, or the accounting and inventory of a business.

BASIC
Beginner's All-purpose Symbolic Instruction Code. A popular, easy-to-learn *programming language* widely used with *microcomputers*.

Baud
Bits per second. A unit of measurement that describes the rate at which *data* are transmitted from one device to another, such as computer to *printer*, computer to computer, or computer to *terminal*.

Binary code
A number system using only two digits, "0" and "1." Any number or letter can be expressed as a combination of these digits. Computers use the system by translating each *character* of information into a string of binary numbers.

Bit
The smallest unit of information a computer uses. A bit is either the digit "0" or "1." An "eight bit" processor manipulates *data* in clusters of eight bits.

Board
Printed circuit board. A flat, thin rectangular component of a computer that includes one or more layers of printed circuitry and to which *chips* and other electronic parts are attached. As an add-on to an existing computer, sometimes called a card.

Boot
Derived from "bootstrap." To start or restart a computer system by *reading* instructions from a storage device into the computer's *memory*.

Bug
An error in the logic of a computer *program* that prevents it from running properly. Bugs can cause a program to "freeze up," that is, to repeat the same operation endlessly. Finding and correcting the error is called debugging.

Bus
A device that connects components of a computer so that *data* can flow between them. There are several conventional buses that allow components made by different manufacturers to be used in the same computer.

Byte
One byte contains eight *bits*, enough to stand for one *character* of English, or one number. Thus, it generally takes more than one byte to make up a word. "Cat," for instance, requires three bytes.

CAI
Computer Assisted Instruction. A term applied to a wide range of instructional *software*, including drill-and-practice, simulation, and educational games.

Cartridge
A device that stores a prerecorded *program*. A cartridge is inserted into a special slot built into the computer. Also known as a solid state cartridge or *ROM* module.

Cassette tape recorder
Computer cassette recorders are usually the same as those used for audio recordings, but often need a special cable to connect them to the computer. They house and run magnetic tapes that either hold a prerecorded *program* or store *data* from the computer.

Character
A letter, number, or symbol.

Chip
A small (about the size of a child's fingernail) component that contains a large amount of electronic circuitry. Chips are the building blocks of a computer and perform various functions, such as doing arithmetic, serving as the computer's *memory*, or controlling other chips.

Command
An instruction that tells the computer to do something, such as to run a *program*.

Compatibility
The ability of different devices, such as a computer and a *printer*, to work together; or the ability of a particular *program* to run on a given computer. In short, the ability of anything in a computer system to work with anything else.

CP/M
Control Program for Microprocessors. A widely used *operating system* for microcomputers.

CPU
Central Processing Unit. The "heart" of a *microprocessor*, with components that control the interpretation and execution of instructions.

CRT
Cathode Ray Tube. A TV or TV-like *monitor* used to display information and pictures. Also called a computer screen.

Cursor
A symbol, usually a small square, that indicates where the next *character* will appear on the CRT screen.

Data
Information put into or taken out of a computer.

Data bank
A central location for storing vast amounts of information accessible by computer.

Data-base manager
A *program* that allows the user to enter, organize, sort, and retrieve information.

Disk
A magnetic device for storing information and *programs* accessible by a computer. A disk can be either a rigid platter (hard disk) or a sheet of flexible plastic (floppy diskette). Disks have tracks, much like grooves on LP records, where *data* is stored.

Disk drive
A device that *reads* information from a *disk* and copies it into the computer's *memory* so that it can be used by the computer, and that *writes* information from the computer's *memory* onto a *disk* so that it can be stored.

Documentation
The written instructions that explain how to use computer *hardware* or *software*. Also refers to all instructions and remarks, used to describe procedures when programming.

DOS
Disk Operating System. See *operating system*.

Downtime
Time when a computer is not working.

Electronic mail
The transmission of messages, documents, or other information from one computer user to another. This can be done over telephone lines using devices called *modems*.

Emulator
A *hardware/software* device designed to translate *programs* written for one particular computer so that they will run on another computer.

Firmware
Programs or *data* stored in *ROM*—either built-in by the manufacturer, or added with a cartridge—that cannot be changed by the user.

Flow chart
A diagram on paper that shows all the logical steps necessary to write a *program*.

Format
To prepare a *disk* so that it can receive and store information. Until you perform this task, the *disk* will not be able

THE PRIMER
THE WORDS

to store any information. The word "initialize" is often used to mean the same thing as format.

Function key
A special key on the computer's *keyboard* that has been or can be designated to perform a specific task.

Graphics
Pictorial displays on the *CRT*, such as charts, graphs, and symbols. Contrasted with *text*.

Graphics tablet
A kind of electronic drawing board. With a graphics tablet and a special pen, whatever you draw will appear simultaneously on the *CRT*.

Hard copy
Information printed by the computer onto paper.

Hardware
The physical, nonchanging parts of a computer system. Contrasted with *software*, or *programs*, which can change.

High-level language
A *programming language* that resembles an ordinary spoken language (e.g., English). *BASIC* is a high-level language.

Input
Programs or *data* entered into the computer.

Interface
An electronic connector between the computer and its *peripherals*.

K
Abbreviation for kilo, or 1,000. When used to describe the amount of *memory*, or storage space, a computer has, it often signifies 1,024. A computer with 16K *bytes* of *memory*, for example, can store 16,384 *characters* of information.

Keyboard
Designed much like that of a standard typewriter, the keyboard is used to enter information into the computer.

Load
To enter a *program* from an external storage device into the computer.

Information services
Broad-based *data bases* that offer a variety of services, ranging from airline reservation information to stock market quotations. You need a *modem* to link up with such a service.

LOGO
A *programming language* that allows the user to draw pictures on the screen. LOGO is particularly good for teaching young children how to *program*.

Loop
A statement in a *program* that instructs the computer to repeat a certain task.

Machine language
A binary code consisting of "0s" and "1s," which is the only language a computer understands. *Programs* written in any other language, such as *BASIC*, are translated into machine language for processing.

Membrane
A type of computer *keyboard* with a flat, smooth surface.

Memory
The place in a computer where *data* and *programs* are stored.

Menu
A list on a *CRT* of the operational options of a computer *program*; a list of programs stored on a tape or *disk*.

Microcomputer
A small computer designed primarily for home or small business use. The micro can do today what many room-sized mainframe computers did 20 years ago.

Microprocessor
A tiny processor on a single *chip*. The "brains" of all *microcomputers*, it is also found in many consumer and industrial products.

Modem
A contraction of Modulator/Demodulator. A device that makes it possible to transmit and receive computer *data* over telephone lines.

Monitor
A device for visually displaying a computer *program* or the results of that program on a screen. See *CRT*.

Network
A system of linking computers so that users can share resources and exchange information.

Operating system
A *program* that controls the operation of a computer system, such as controlling signals to the *disk drive* or *printer*. When a computer system is turned on, the operating system is the first program executed. All subsequent programs are loaded and supervised by the operating system.

Output
Computer-generated information that is transferred to a *monitor*, *disk*, tape, or *printer*.

PASCAL
A *programming language* that can be used on many *microcomputers*. While it is considered more difficult to learn than *BASIC*, it can generate *programs* that run faster and use less *memory*.

Peripherals
Hardware accessories for a computer, such as a *disk drive*, *printer*, or *modem*.

Pixel
Stands for "picture element." A single dot of light on a TV screen or computer monitor. These tiny elements are used to create electronic pictures, or *graphics*.

Plotter
A machine, attached to a computer, that prints lines or graphs on paper.

Printer
A machine that transfers information stored in the computer onto paper. Two of the most commonly used printers are: dot matrix—a printer that forms *text* or *graphics* using a group of individual points (dots); and letter quality—a printer that prints fully formed characters (like a typewriter), using a type element called a "daisy wheel."

Program
A set of step-by-step instructions that tells a computer how to solve a given problem. Also, to prepare such a set of instructions.

Programming language
A language, with clearly defined rules, that can be used to express a computer *program*.

RAM
Random Access Memory. An area in the computer where information is stored. When called into this area, information can be *read*, changed, or edited. However, it will be lost when the computer's power is turned off, unless you first *save* the information.

Read
The process of copying information from a storage device (such as floppy *disk* or tape) into the computer's *memory*. Reading only copies; it does not erase the *data* from where it is stored.

Resolution
The sharpness of a picture on a *CRT*, usually described as "high" or "low." The higher the resolution, the sharper the picture. Resolution is expressed by the number of *pixels* in the display. For example, 560x720 is much sharper than 275x400.

ROM
Read Only Memory. Permanent *memory* built into a computer by a manufacturer. The information stored here gives the computer operating instructions when it is first turned on. The user cannot change this memory, but "only read" it.

Save
To store information from *memory* on tape or *disk* so that it can be used again.

Software
Computer *programs*. Also, tapes and *disks*.

Stringy floppy
A computer storage device that holds a magnetic tape, called a wafer. The enclosed wafer tape is thinner, narrower, and faster than conventional cassette tapes.

Terminal
A computer user's workstation. Also refers to the computer screen where information is displayed.

Text
Words, letters, and numbers that appear on a *CRT*. Contrasted with *graphics*, which are lines, shapes, and symbols.

Winchester
A type of hard disk that is sealed in an air-tight, dust-free container. See *disk*.

Word processor
A *program* that allows the user to write, edit, or rewrite *text*. The *text* can be saved on a storage device and printed out. A word processor allows the user to make changes in the same *text* without retyping the whole page.

Write
The opposite of *read*. To transfer information from the computer's *memory* to a storage device such as a floppy *disk*. Write-protect is a procedure for preventing a disk from being written to.

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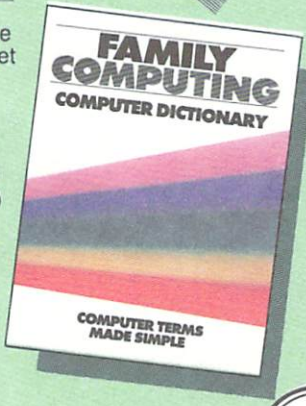

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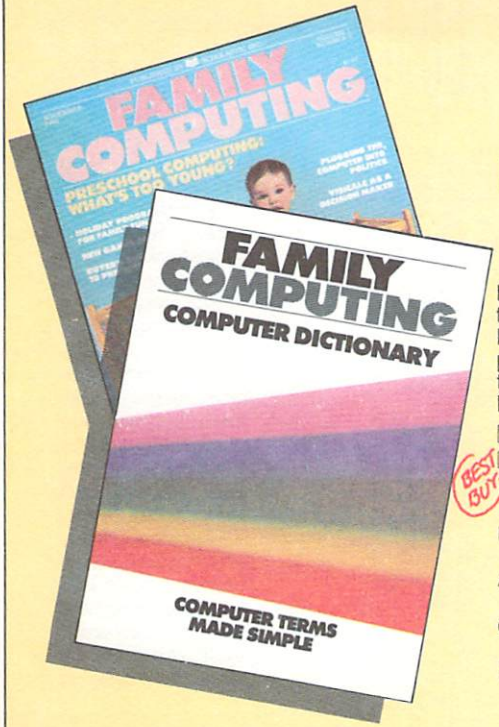

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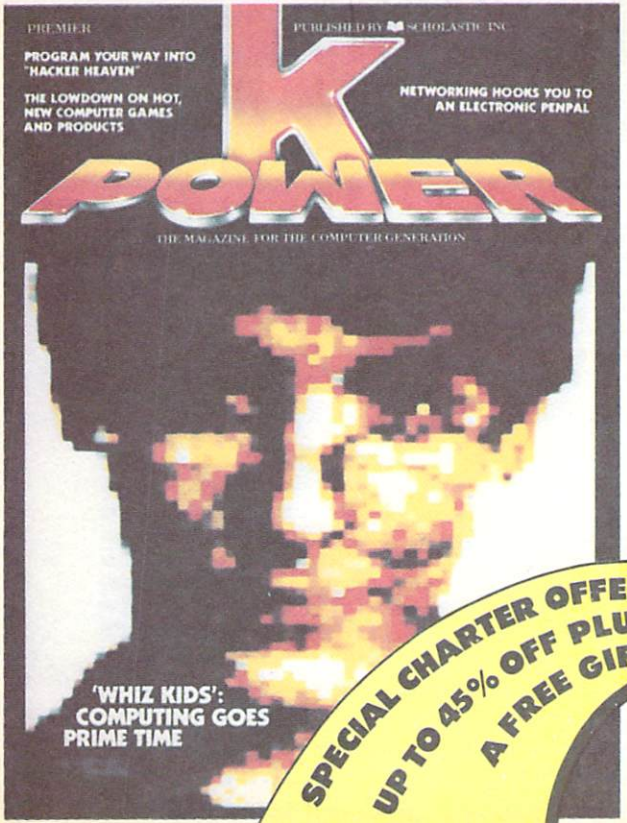

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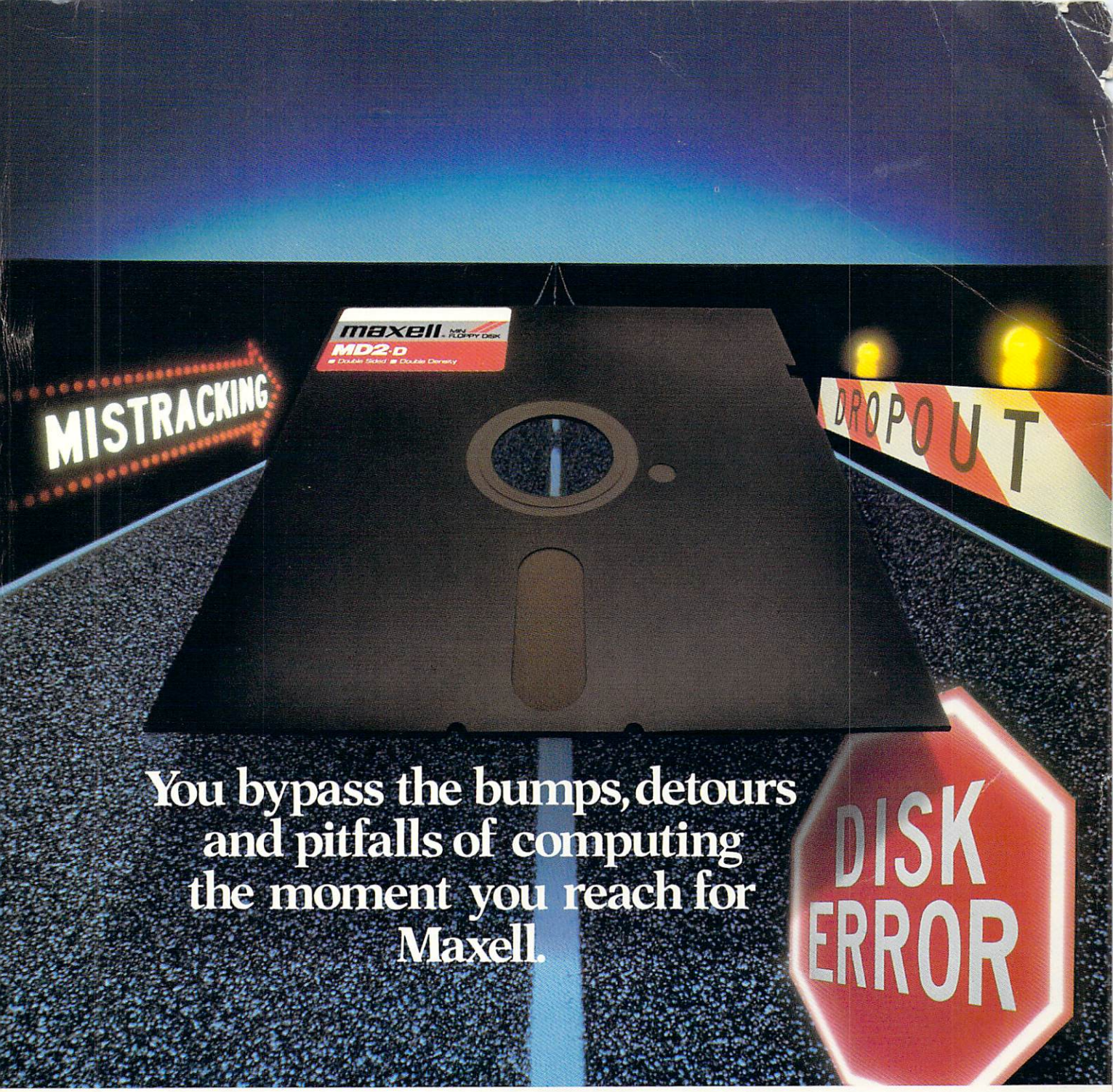

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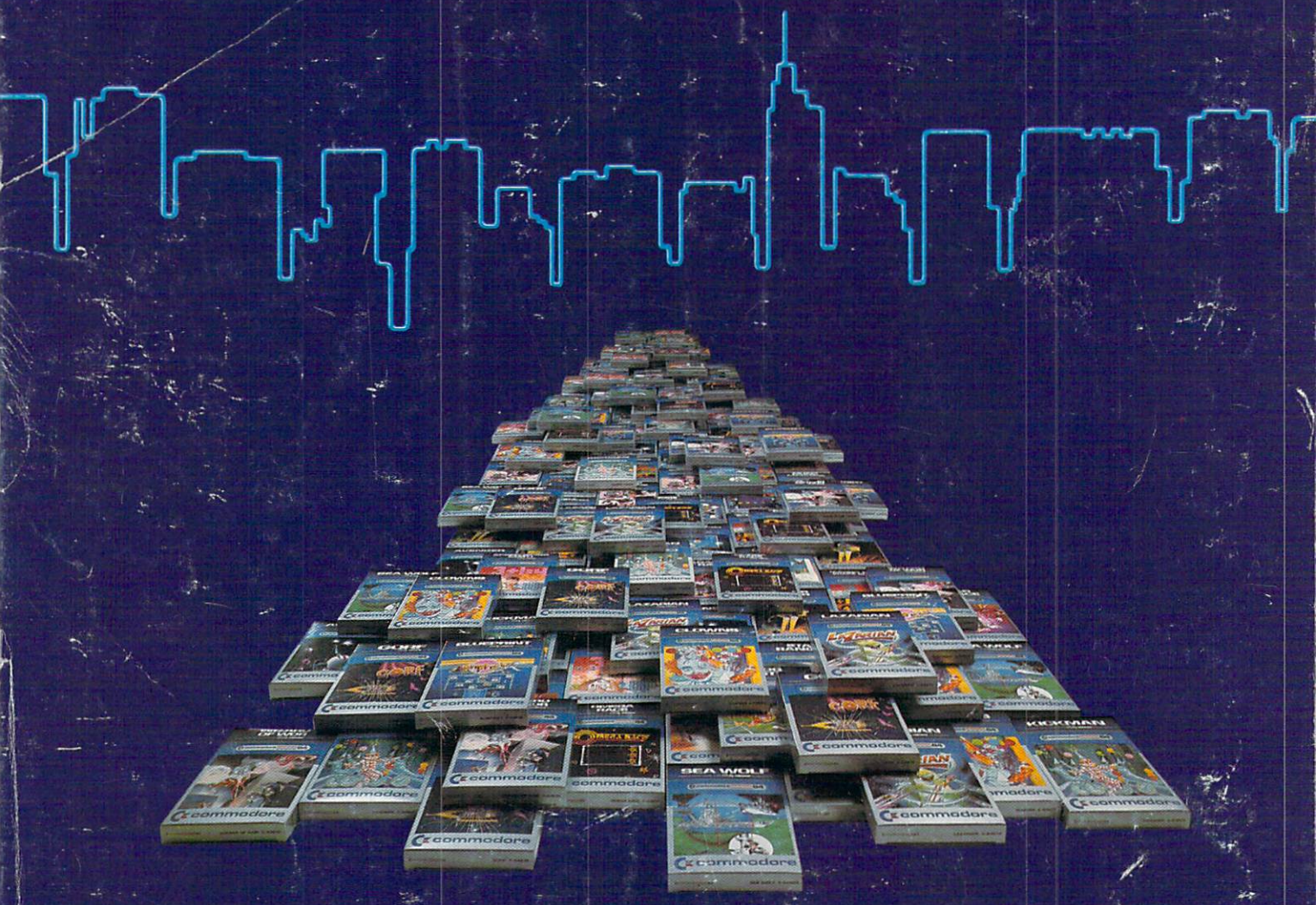

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